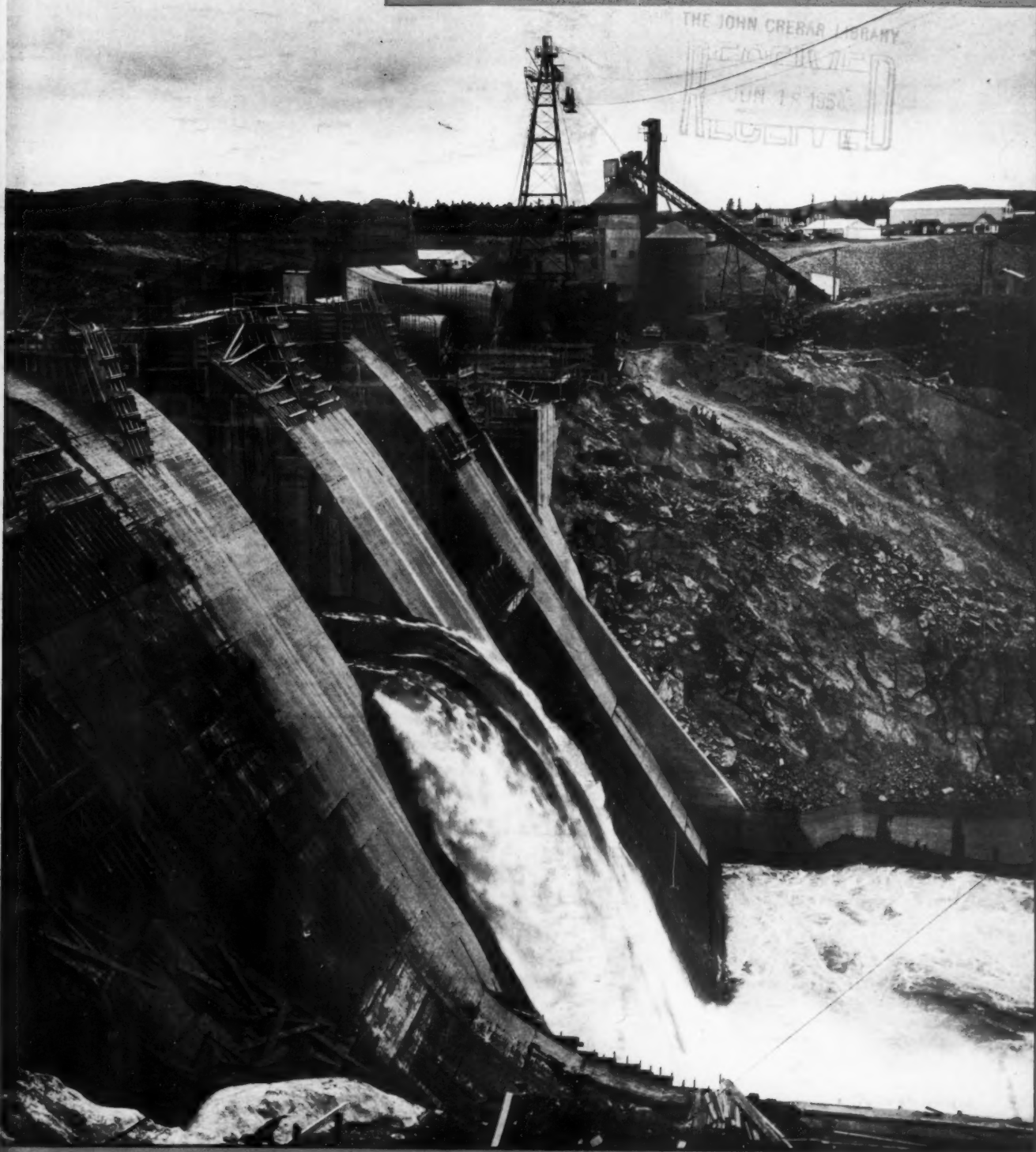


520

Contractors and Engineers

magazine of modern construction

JUNE 1954



Maine's Kennebec River cascades over the uncompleted spillway at Indian Pond Dam as the last two monoliths are built up. Concrete is batched and mixed in a Johnson plant and placed by a Sauerman cableway.

Page 26

How To Obtain Concrete Which Will Have Minimum Shrinkage

Drying shrinkage, as every concrete man knows, is a serious enemy of good concrete. Whatever the cement content of a mix or the water-cement ratio, drying shrinkage is governed mainly by *unit water content*.* (Unit water content is the amount of water required per cubic yard of concrete.)

Pozzolith is a positive aid in obtaining lowest unit water content, whatever the workability requirements.

For a given workability, the dispersion of cement with Pozzolith decreases the amount of water required in a cubic yard of concrete by approximately 15%. To the

best of our knowledge there is no other material which will achieve a lower unit water content and yet maintain the required workability.

In addition to providing minimum shrinkage, this reduced water-cement ratio will result in concrete having substantially higher strength. Low permeability, increased bond of concrete to steel and improved resistance to freezing and thawing are other important advantages resulting from low unit water content with Pozzolith.

*U. S. Bureau of Reclamation Concrete Manual, 5th Edition, Page 40.

"IRON-CLAD" CONCRETE FOR HEAVY TRAFFIC AREAS

The Masterplate "iron-clad" concrete floor is 4-6 times more wear-resistant than the best plain concrete floor, also corrosion-resistant, spark-safe, easy-to-clean, non-slip, non-dusting and economical. Non-colored and colored.



Experience in all types of plants has proved the value of Masterplate "iron-clad" concrete floors in helping to maintain a smooth flow of production, reduce maintenance expense and improve plant safety.

Only with Masterplate can a Masterplate "iron-clad" concrete floor with all its important service advantages be obtained. This is because only Masterplate contains the cement-dispersing agent calcium lignosulfonate which makes it possible to easily float a pound or more of the tough, ductile metal on fresh concrete and keep it at the surface.

Full information on Masterplate—for new floors and resurfacing old concrete floors—and "do-it-yourself" demonstration kit supplied on request by the manufacturer, The Master Builders Co., Cleveland 3, Ohio.

COLORED CONCRETE FLOORS FOR LIGHT TRAFFIC AREAS

Colorcron is being widely used by contractors to obtain uniformly colored, long wearing concrete floors for show rooms, churches, schools, apartments and offices; also for recreation rooms, patios, driveways, sidewalks, breezeways and garages. Floors can be scored to any desired pattern.



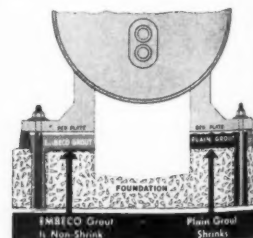
Color Plus Long Wear

Colorcron floors cost less additional than painting the floor, outwear the best plain concrete floor, and have more uniform and more intense color than is obtained from the use of pigments put in the mix. Colors: light grey, dark grey, red, brown, black, green, dark green, and non-colored.

Full directions for the use of Colorcron may be obtained from the manufacturer, The Master Builders Co., Cleveland 3, Ohio.

FOR NON-SHRINK GROUTING

To avoid shrinkage—principal cause of failure in equipment grouts—plant engineers use Embeco metallic aggregate, the material that produces a non-shrink flowable grout.



Cross-section shows how an easily placed, flowable Embeco Grout counters shrinkage to produce full contact with bedplate.

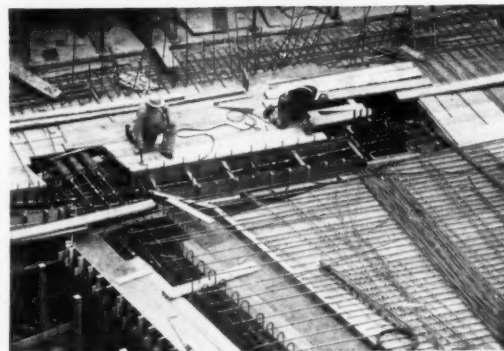
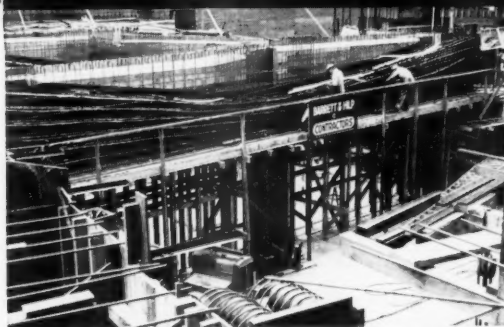
Following are a few of the many other uses of Embeco non-shrink mortar: grouting anchor bolts; grouting steel floor grids; grouting pipes through walls; caulking bell and stand pipe; patching floors, ramps and platforms.

A 16-page booklet of useful data and information on the Embeco Non-Shrink Method of Grouting may be obtained from the manufacturer, The Master Builders Co., Cleveland 3, Ohio.

world's heaviest prestressed girders here...



Barrett-Lick Garage, San Francisco, California. Structural Engineers—Ellison and King, San Francisco; General Contractor—Barrett and Hilp, San Francisco; Ready-Mixed Concrete supplied by Consumers Rock and Cement Co., San Francisco. All concrete produced with Pozzolith.



POZZOLITH* an aid in meeting concrete requirements

This project represents the successful solution of many engineering problems. One was to produce concrete of the required strength and workability with low unit water content...to obtain quality and economy.

As in the case of many other structures built during the last 20 years, builders found that Pozzolith enabled them to produce a mix with the least amount of water. Result—better quality concrete plus a savings.

By reducing water, Pozzolith provides these well known benefits of low unit water content—reduced bleeding and segregation, minimized shrinkage, low permeability, increased bond-to-steel and improved durability. Full information on request.

*POZZOLITH...the cement-dispersing, water-reducing agent which makes available the optimum amount of air in concrete and fully complies with the water-cement ratio law. Added to the mix at the mixer. Pozzolith was developed by The Master Builders Co. in 1932.

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So you want to get a construction loan?

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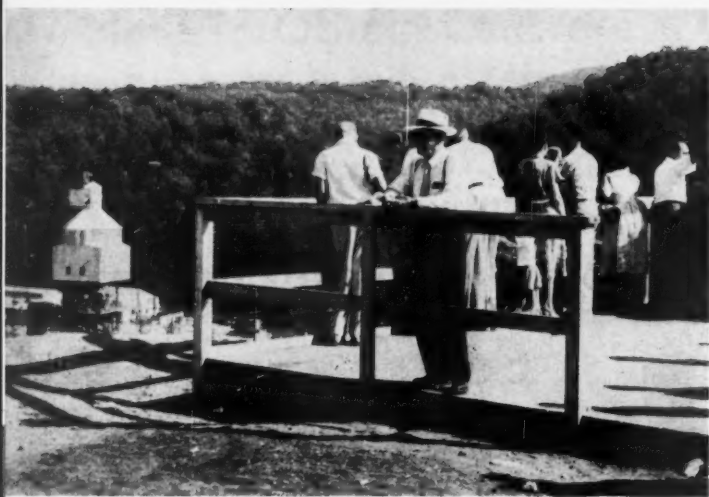
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EDITORIAL

Private Power's Biggest Year

Starting on page 26 in this issue is a report on the construction of Indian Pond Dam, a hydroelectric project being built by the Central Maine Power & Light Co. Last month we published an article on the Connecticut Light & Power Co.'s new Shepaug hydroelectric development. A future issue will describe the construction of the Roanoke Rapids Dam in North Carolina, a project held up for years until the Virginia Electric & Power Co., Inc., finally won its long battle with the previous administration for permission to build the dam.

The construction of such worthwhile projects is indicative of a trend away from federal monopoly of electric power. Secretary of the Interior Douglas McKay has already issued a statement on the federal power program which would discourage any attempts to socialize the electric industry.

Electric utility companies today are in the midst of the largest construction program in their history. They comprise the only major group engaged in private construction which has increased its capital outlays each year throughout the post-war period.

The entire electric utility industry has scheduled completion of 14,100,000 kw of new generating capability this year, 9,430,000 kw of which is planned by investor-owned companies having a budget of over \$3 billion.

In addition, private power is ready to develop large power sources—such as Niagara Falls—as long as they are economically feasible. Pending legislation on the Niagara issue will determine whether federal and state governments will be allowed to enter into the power business where issues of navigation, irrigation, or flood control are absent.

The country's electric industry, huge today, will soon grow even larger. If the nation's economy remains strong, the industry may have to double its capacity by 1963. How much of this expansion the government intends to sponsor is of deep concern to the investor-owned industry.

It is of concern to private citizens too, since private power development offers relief to the taxpayer by creating new sources of revenue. Lower rates should result from economical construction and operation.

The people are aware of these facts, and they are watching construction of these new power projects with great interest. A good example is Shepaug Dam in Connecticut (photo above) where hundreds of local residents jam the company's special observation platform every weekend to view the progress of construction.

No one profits more from private hydroelectric development than the public.

NEWS AND VIEWS

With building activity expected to be stronger throughout this month and **construction awards, which last month set a record high for May**, also expected to rise, the awaited break in construction seems further away than ever. Disregarding fluctuations in both work and awards, the industry's prospects for both the immediate future and for some time to come look good.

In the long run, look to two major items to make news. **Highway work is on the brink of its biggest boom**, and the path has been cleared for the construction of the St. Lawrence Seaway.

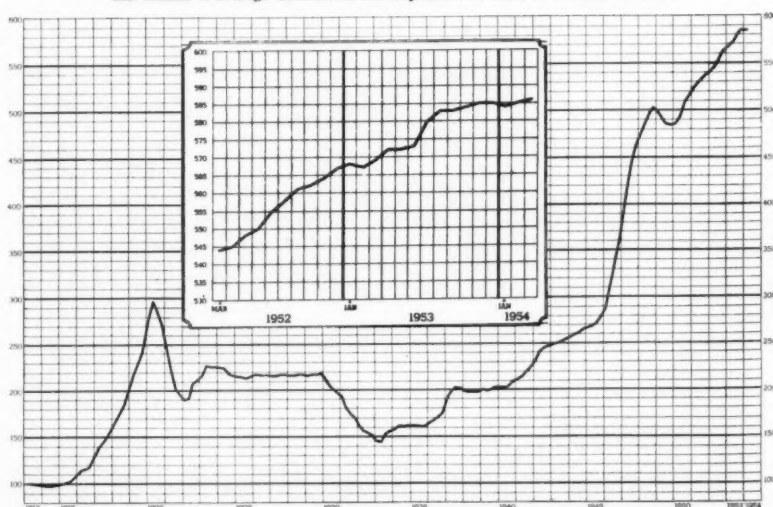
The seaway, a dream for the past half century, came a step closer to reality on May 13 when President Dwight D. Eisenhower signed the bill allowing the government to join Canada in building a 27-foot-deep channel through the St. Lawrence River. Locks 800 feet long, 80 feet wide, and 30 feet over the sills at the International Rapids section of the river, and dredging work in the vicinity of the Thousand Islands, make this **one of the biggest jobs of the past few decades**. The U. S. will spend \$105 million on the project, and Canada, \$200 million.

Deepening of the present channel will **open the Great Lakes to ocean shipping**. The present channel, deepened from 9 to 14 feet in the early 1900's by Canada, now accommodates only smaller ships. The project, bitterly opposed by rail, shipping, and coal interests, was shelved during World War II, then brought up again in 1945, when the St. Lawrence power project was approved. Canada's intention of building the seaway alone, if necessary, helped effect passage of the new legislation, which had to weather a last-minute amendment designed to kill the project again.

Just a week before the bill was signed, the President put his signature to the federal-aid bill for highways, which provides **\$1,932,000,000 for road construction** between 1955 and 1957.

Since the new law gives states about a **50 per cent increase in federal aid**, it will probably cause increased pressure for heavier highway-user taxes to enable states to secure more of the available funds. New Jersey and Montana are two states in which increases in the gasoline tax have already been advocated.

The American Appraisal Company Construction Cost Indexes and Graph
Cost Indexes of Average Construction and Representative Items of Material and Labor



NOTE—This index applies to construction only and does not include building fixture items such as plumbing, heating, lighting, sprinkler system, etc.; it is based on average costs under normal conditions with no allowance for overtime, premiums on materials, or special conditions. It is the composite of four types of buildings—frame, brick, concrete, and steel—in 30 representative cities, and therefore should be used only as a trend as it is not applicable to specific buildings.

Bascule Span to Carry New Toledo Expressway

ONE OF THE MAJOR links in the new Toledo Expressway will be completed when work is finished on the Maumee River Bridge, about a mile east of downtown Toledo, Ohio. The bascule structure will carry six lanes of traffic over five river spans. Its primary purpose is to accommodate northern Ohio traffic along the south shore of Lake Erie toward Detroit. It will enable through traffic to bypass busy downtown Toledo.

The Merritt-Chapman & Scott Corp., Cleveland, Ohio, held the contract for the substructure of the new bridge. Starting work in May, 1952, the corporation completed its \$2,200,000 job at the end of 1953. The structure was designed for the State of Ohio, Department of Highways, by Howard, Needles, Tammen & Bergendoff, New York, N. Y.

The Merritt-Chapman & Scott contract called for the construction of five concrete river piers. The two bascule piers are 215 feet apart, providing a horizontal clearance of 200 feet. Because the center line of the channel is 290 feet from the west bank, the first pier out from that side will support the rocker part of the bascule. The larger bascule pier has a 148 x 63-foot tremie seal 11 feet thick. This is topped by a 10-foot footing and a main pier structure with 5-foot-thick walls. All piers are supported on steel H-piles carried to rock.

The contractor brought in several 25-ton floating rigs and began his cofferdam work by excavating the riverbed material with clamshell buckets. Timber piles were then driven at the first pier to support the cofferdam frame. The two-level frames, fabricated on shore, consisted primarily of 24-inch beams cross braced with 14-inch beams. Levels were 24 feet apart.

The frames were set on the wood piles to act as a template for the MZ38 sheets, which were driven two at a time with a Vulcan 50C hammer. The cofferdams were then excavated to the proper level, and the steel bearing piles were driven to rock. The contractor used a 70-ton floating rig, the Gotham, to drive the H-piles with a McKiernan-Terry S8 hammer.

When the piles were driven, the frame was reinstalled, the sheets bolted to it, and tremie seals poured. Seals ranged from 5 to 11 feet thick and required up to 4,000 yards per pour.

The pier nearest the west shore was poured by bringing transit-mix trucks out on the dock and unloading them into 3-yard buckets supported on shore platforms. Buckets were then picked up by one of the floating rigs, swung over the tremie hopper, and dumped. The 12-inch tremie required up to 55 feet of pipe to transfer concrete to the seal.

At the bottom of the pipe, the contractor rigged up a plugging device which worked very well in pre-

Tremie seals for five piers are 5 to 11 feet thick; substructure calls for 29,000 yards of concrete

The derrick boat Chippewa dumps concrete into a Blaw-Knox steel form for a shaft pour on the Toledo Expressway span. Forms were backed by double 8-inch channels.

C&E Staff Photo



Widening existing pavement with hot-mix Texaco Asphaltic Concrete laid in four courses with total thickness of 14 inches.



A trench roller was used to compact the four layers of asphaltic concrete laid next to old pavement.



Blade grader spreads one of the two asphalt leveling courses constructed on 29 miles of Texas Route 6.



Putting down the Texaco Asphaltic Concrete wearing surface, bringing total thickness of new asphalt pavement to 5 inches.



View of completed project, except for shoulders. Trucks represent large percentage of highway's 3,000 vehicle a day traffic.

Modernizing 29 miles of old, narrow highway

Contractor: Gulf Bitulithic Company, Houston, Texas

One of the most important recent projects of the Texas State Highway Department called for modernizing 29.7 miles of Route 6 in Brazos and Grimes Counties. The work required the use of 140,000 tons of hot-mix Texaco Asphaltic Concrete.

Two different methods were employed in widening the old 9' x 6" x 9" concrete pavement. For 19 miles, a 14-inch thickness of asphaltic concrete was added at either side. The other section was widened with 8 inches of crushed stone on a 4-inch sand cushion. The entire mileage was resurfaced with a three-course asphaltic concrete pavement, having a combined thickness of five inches.

An interesting feature was the use of a 135-

penetration Texaco asphalt in the asphalt mix for widening, as well as for the two leveling courses of the new pavement. A 90-penetration Texaco asphalt went into the wearing surface. These two products, like every other Texaco asphalt cement, cutback asphalt and slow-curing asphaltic oil, are produced from scientifically selected crudes. Into their refining, Texaco puts the experience acquired in supplying asphaltic materials to American road builders from the Atlantic to the Rockies for over half a century.

Helpful information on all types of asphalt construction for streets and highways is supplied in two Texaco booklets, which are yours for the asking, with no obligation.



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TEXACO ASPHALT

(Concluded on next page)



A cofferdam for a bascule pier of the Maumee River Bridge is built with the help of a Wiley Whirley. The \$2,200,000 contract was held by Merritt-Chapman & Scott Corp. C&E Staff Photo

(Continued from preceding page)

serving the seal. A steel plate was fitted with three vertical rods that ran up 18 inches through metal loops on the outside of the tremie pipe. A cable was attached to the center of the plate and carried up inside the pipe. When the tremie pipe was first filled with concrete, the cable pulled the plate against the bottom as the pipe was lowered into the water. When the pipe reached bottom, the cable was released, the pipe was lifted, and concrete poured out intact. If the pipe had to be lifted

out of water to place it in a new position, the cable pulled the plate shut, thus preserving the seal.

Concrete for all the other piers was carried out on a trestle in transit-mix and Hercules open-body trucks. At the pier farthest from the east shore, the trucks drove out to the end of the trestle, turned around on a 20-foot-diameter electrically powered turntable, dumped into buckets, and drove back.

Pouring During Gale

But all of the tremie pours were not completed without incident. On the large bascule pier near the west shore, a total of 2,600 yards of concrete had been placed in the seal when a fierce gale blew up, and there was still 900 yards to go. One rig was put out of action when the winds and rough seas extinguished the flame in the boiler. But the big 70-ton Gotham finished the placing job by itself, as the crew battled through the hazardous period. Finally, 62 hours after starting, the 3,500 yards of monolithic concrete were in place.

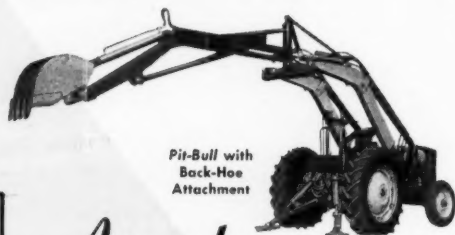
When the cofferdams were unwatered, the laitance was removed from the top of the seal, and forms were erected for the footings and shafts. Blaw-Knox steel forms, backed by double 8-inch channels and plywood forms, were used on all the shafts. Six 12-inch steel strongbacks, 46 feet long, were supported by the footing and the sheeting. Screw shores were used inside to maintain the proper width of shaft during the pour. Concrete was placed through six elephant trunks hung from 8-inch channels. Nine 24-inch corrugated metal pipes were set up vertically inside the shaft forms to ventilate the pour. After 90 days, they were filled with concrete.

V. L. Rock was superintendent for Merritt-Chapman & Scott, and Joseph W. Koch was construction engineer. F. Langenderfer was project engineer for the Ohio State Department of Highways, which is headed by S. O. Linzell, director, and L. Schaeublin, chief engineer. He worked under the direction of G. M. Lieber, division engineer, and H. R. Craig, chief engineer of construction.

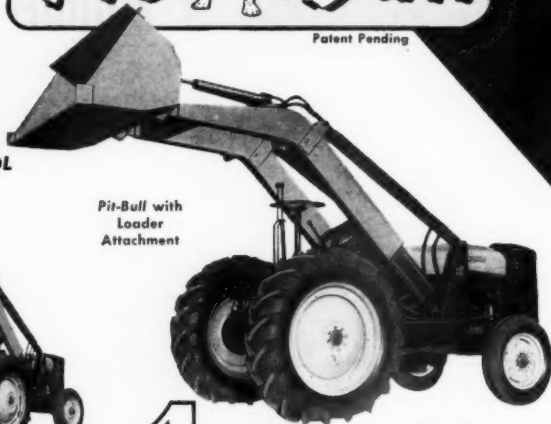
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need. Cab is available as extra equipment. A synchro-mesh transmission gives you four speeds in each direction *plus* extra power for digging and loading, and also permits you to change directions instantly without shifting gears. The steering mechanism and seat arrangement, *plus* easy-to-handle control levers, allow the operator to be comfortable and have clear vision with finger-tip control of both the tractor and **Pit-Bull** at all times. It's a quality performer with an eye for profit!

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there's little time lost in getting on to another job. Compare **Pit-Bull**, pound for pound, dollar for dollar; you'll see why it's called the high-quality unit that replaces high-inventory equipment. Ask for a demonstration.

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Concrete, carried to the end of a trestle in a Hercules open-body truck, is transferred to a 3-yard bottom-dump bucket. C&E Staff Photo

CONTRACTORS AND ENGINEERS



George F. Ferris, recently elected president of The Moles.

George F. Ferris Is New President of The Moles

The nation's tunneling and heavy-construction men elected George F. Ferris president of their association, The Moles, at the annual meeting in New York's Roosevelt Hotel. Mr. Ferris succeeds Richard E. Dougherty.

Other new officers include A. Holmes Crimmins, first vice president; Thomas J. Walsh, Jr., second vice president; Harry T. Immerman, secretary; and Edward G. Johnson, treasurer.

Mr. Ferris is president of the Raymond Concrete Pile Co., New York, N. Y. Active in engineering and construction work for 30 years, he is a member of the American Society of Civil Engineers and the board of governors of the New York Building Congress. He was awarded the Navy's Distinguished Public Service Medal for his work in coordinating naval air base construction in the Pacific during World War II.

He also has been named chairman of the Building Construction and Building Materials Committee of the Committee of American Industry, a division of the National Fund for Medical Education.

Mr. Ferris will seek to enlist the support of his industry for a CAI campaign to raise \$10,000,000 for the nation's 79 medical schools.

Reconstruction Program On Westchester Parkway

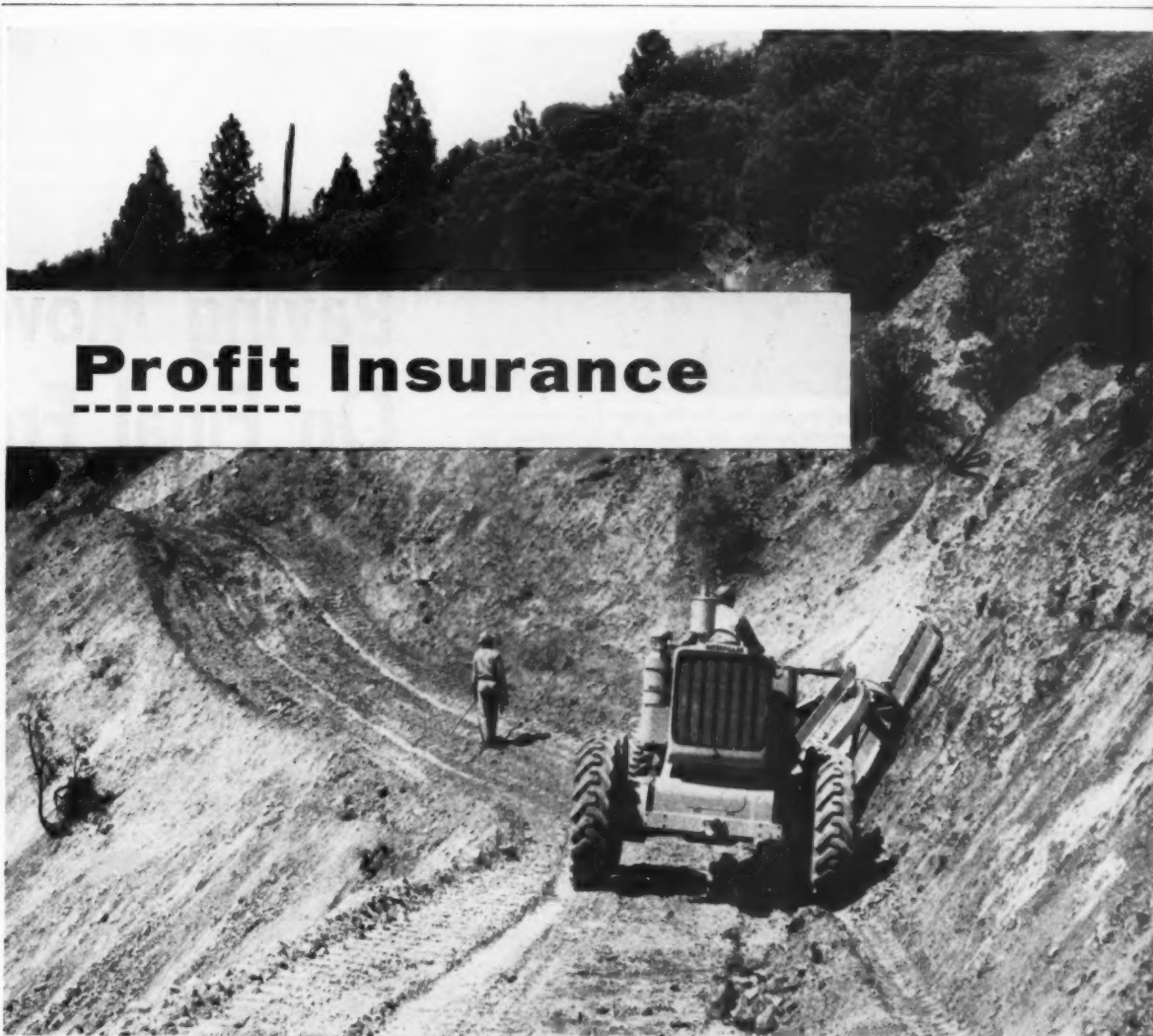
With the allocation of \$215,000 for an engineering plan to convert 18 miles of the Hutchinson River and Cross County Parkways into broad highways, the Board of Supervisors of Westchester County, N. Y., last month came a step closer to modernizing its parkway system. Plans for the work are expected in six to eight months, and detailed construction drawings should be ready in another year.

Complete reconstruction of the Hutchinson River Parkway for an approximate \$35,000,000 was recommended by Edwards, Kelcey & Beck, consulting engineering firm of Newark, N. J., in a report submitted to Westchester officials. This 25-year-old road, running from the Bronx-Whitestone Bridge in the south to the coastal regions in the north, originally had four 9-foot undivided traffic lanes. Since the first 11-mile stretch was opened in 1928, the road has been remodeled, so that it now has two roadways 23 feet 4 inches wide, separated by a center divider.

Road conditions on the parkway were termed "critical" in the report made by Edwards, Kelcey & Beck. The parkway has an almost continuous horizontal curvature, inadequate sight distances on hills and curves, inadequate shoulders, an inadequate medial divider, and inadequate acceleration and deceleration lanes. Suggested reconstruction calls for an 8 and 6-lane highway allowing for a maximum speed of 60 mph. The present parkway would be incorporated into the new facility,

and it is believed that traffic could be maintained on the road during the 2 or 3-year construction period. Traffic lanes would be 12 feet wide, shoulders 10 feet wide, and a center mall, 30 feet wide. All but four existing bridges on the parkway would be saved. Although the report advanced alternate plans calling for expenditures of eight million and eleven million dollars, respectively, it stressed that anything less than complete reconstruction of the road would be "unsatisfactory."

This report followed a traffic and accident survey submitted by Wilbur Smith & Associates, New Haven, Conn., which showed that while the Hutchinson River Parkway comprised only 25 per cent of the parkway system, more than 33 per cent of parkway accidents, and more than 55 per cent of fatal accidents occurred on this road. The parkway was originally planned as a pleasure route, but has since become a heavily traveled artery between New York City and New England.



Profit Insurance

J. H. Trisdale, Inc., of Redding, Cal., was awarded the contract on this tough road-building job in Shasta County, Cal. It called for moving more than half a million yards of dirt and building an 18-foot road of crushed rock through nearly eight miles of hilly country. County-supervised, with funds supplied by the U. S. Bureau of Roads, the road will reopen to mining and recreation an area that was flooded by Shasta Lake. This Caterpillar No. 12 Motor Grader, shown bank shaping, is one of a fleet of Trisdale's Cat* machines on the job. When it comes to costs, you can count on Caterpillar equipment. These rugged, fast-working machines can be your insurance that a really tough operation stays on the profit side of the ledger.

Largest motor grader in the Caterpillar line, the No. 12 delivers a full 100 HP to the blade. You can get the *most* out of the No. 12 because of its precise balance between power, weight and working speed. Only Caterpillar Motor Graders are built entirely by a single manufacturer. There's no compromising, no "making do" with available components.

Of all the motor graders ever built by Caterpillar, 99% are still on the job! A look at the rugged construction of the No. 12 will show you why. For example, the box-section circle weighs 35 pounds per foot—the strongest circle on *any* grader!

Your Caterpillar Dealer will demonstrate the features that make Cat Graders fast and easy to operate: wide range of blade positions, unobstructed operator vision, constant-mesh transmission, anti-creep controls. Whichever Caterpillar Grader you select, your nearby dealer is a single, *dependable* source for parts and service.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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With GMC batch trucks supplying materials, the Rex paver lays concrete on a curve of the Hollywood Freeway outside Los Angeles. J. E. Haddock, Ltd., Pasadena, Calif., had the paving subcontract on this job.



Viber electric vibrators mounted on the rear of this Jaeger spreader compact the edges of the concrete. The Rex paver is just ahead of the spreader.

Paving Moves Rapidly On Final Freeway Link

Divided 6-lane roadway of 8-inch concrete is laid following difficult grading and relocation work

By RAY DAY



The Lakewood finishing machine, following up the paver and spreader, works downgrade around a curve on one of the six 12-foot lanes of the divided highway.

A 1.43-MILE road-construction project completed this spring in Hollywood, Calif., will go down in California highway history as one of the toughest jobs on the Hollywood Freeway system. Constructed by Bongiovanni Construction Co., Los Angeles, on a low bid of \$2,500,000, the project has been unusual in many respects. Bridges with built-in acoustical features, certain excavation and paving difficulties, and a flow of about 125,000 cars daily through the job presented major challenges.

The project represents the last link in the southern California freeway. The highway will be open to traffic this summer. Landscaping and other finishing touches are expected to be completed by August.

With completion of this last section of the freeway, motorists will have an unbroken route, free of traffic lights, between the Los Angeles Civic Center and outlying

State inspectors check the slab surface behind the Johnson longitudinal float finisher to make certain that a smooth surface has been developed. The entire pavement is of 8-inch uniform thickness.





Screw-type dowel bars are used to make the load transfer at the longitudinal center joint. They are installed a day ahead of paving operations.

Workmen in the foreground operate air guns used in cleaning out the pavement joints. An Ingersoll-Rand compressor supplies air for the guns. Paving operations are in progress on the other half of the freeway.



residential areas on the edge of the San Fernando Valley. The final achievement has been long in the making. The first links on the Hollywood Freeway were paved in 1939 and 1940 in the vicinity of Cahuenga Pass. Bongiovanni's job connects that previous work with construction done after World War II on the Los Angeles end.

Started in February, 1952, this final project has come under public fire for the comparatively slow pace at which preliminary work proceeded. The contractors point out, however, that numerous factors made speed impossible at this early stage. Storm sewers, sanitary sewers, gas lines, power lines, telephone cables, and all other utilities had to be preserved intact for uninterrupted service as construction went on. Despite almost superhuman speed and efficiency on the part of utilities crews, this factor alone was a brake on speed. Enormous traffic counts through the job were another deterrent, even though the detour system was so well arranged that injuries and property damage from car accidents dropped from what they had been on the old roadway system.

Designed For Fast Service

The Hollywood link is designed for a 55-mph vehicular speed. Like sections of the modern traffic artery, this job called for a divided freeway with three 12-foot lanes on either side of a 12-foot-minimum dividing median. Traffic lanes consist of 8-inch uniform portland-cement concrete. Under that are 8 inches of select base and 8 inches of granular subbase. The upper 4 inches of select base are cement treated with 3 per cent of portland cement. Subgrades have 95 per cent average compaction.

In addition to these items on the freeway itself, several special structures were provided for in the contract let by the California Division of Highways. The stretch carries the freeway past Hollywood Bowl, site of public meetings and summer music concerts. For this reason, special acoustic qualities were called for in part of the work.

Of the three main structures, the Highland Avenue approach ramp is the most unusual. It carries three lanes of traffic on a bridge deck 40

(Continued on next page)

American Explosives and Accessories Clear the Way for America's Super-Highways!



Here's the Breakdown!

Highway	No. of Contractors	Time	Types of Rock	American Explosives Used
Pennsylvania Turnpike Irwin to Carlisle	5	1939	hard limestone, shale, limestone, trap rock, sand rock	40%, 60% ammonia and gelatin dynamites
Philadelphia Extension Turnpike	5	1949-50	"	"
Western Pennsylvania Extension Irwin to Ohio Line	3	1951	Same, except no trap rock	"
West Virginia Turnpike Charleston to Princeton	4	1953-54	shale and sandstone, hard, medium, soft	40% ammonia and gel, plus semi-gels
New York Thruway Buffalo to New York City	6	1953-54	hard to soft limestone, gneiss rock, trap rock, hard shale	40, 60, 75% standard gel and semi-gels
Ohio Turnpike Eastern border to Indiana Line	1	1953-54	shale and limestone	40% standard gel

Express highways like the famous Pennsylvania Turnpike and the New York Thruway are revolutionizing motor transportation and highway construction methods.

Today, construction engineers and contractors have to think in terms of state-wide roads, over every type of terrain — presenting a wide variety of construction problems. They have to make sure that the equipment they use — the tools, machinery and explosives — will do the job wherever it happens to be.

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(Continued from preceding page)

feet wide. This deck is supported on 8-foot round columns. The design gives excellent visibility underneath the structure from adjacent freeway points, eliminates trouble with skewed bents, and is much more easily constructed than conventional underpinning. This structural concrete was all formed with saw-sized lumber so that it resulted in a rough surface which deadened sound, and the concrete rail was lined with acoustic blocks to deaden traffic noise over the deck. The structure was designed for H20-S16 loading.

Other principal structures in the contract included an off-ramp at Highland Avenue, a 4-lane tunnel undercrossing, two pedestrian crossings, and various concrete retaining walls.

Grading Difficult

Although grading consisted mostly of unclassified excavation, it was a difficult assignment. Tomei Construction Co., Van Nuys, Calif., got the subcontract for this item from the prime contractor. Characteristics of the dirt-moving job included long hauls up to 4,000 feet (most of the dirt was on the east end and had to be hauled to the west end for disposal), with countless delays as many utilities relocations were completed while keeping the lines in service.

Tomei Construction Co. used a fleet of up to seven LeTourneau-Westinghouse Tournamatics, ranging from 12 to 15 cubic yards in capacity. Much of the dirt on the east end was hauled to an abandoned right-of-way of the Pacific Electric Railroad, which was depressed in the general landscape. By filling this depression most of the excess dirt was balanced out. Subgrade material and fills in the roadway section were compacted by Southwest sheepsfoot rollers. Auxiliary tractor equipment with the grading spread included 4 International TD-24's, 3 Caterpillar D8's, 2 Caterpillar No. 12 motor graders, and 2 truck-mounted water tanks.

Select base over the earth subgrade was placed in line with current California practice. The 16-inch course of select decomposed-granite material was hauled by truck from a state-owned pit in the nearby mountains. Blade-mixed with moisture, the base was then laid and rolled by sheepsfoot and rubber-tire rollers. The upper 4 inches of the last course was carefully sized by a Wood windrow sizer, and 3 per cent of Colton bulk portland cement was injected. Mixing with water was then done by a Wood Roadmixer, the stabilized material was blade-spread and compacted, and a seal coat of asphalt emulsion applied.

Paving Moves Fast

The concrete paving assignment, one of the few job items where full efficiency production could be developed, was let on a subcontract basis to J. E. Haddock, Ltd., Pasadena, Calif. The Haddock firm has also paved many other sections of southern California's highway system.

To set up for this job, the Haddock organization brought in 20,000 feet of 8-inch Blaw-Knox steel forms for use along the length of the job. An aggregate supply and batching

arrangement was made with Consolidated Rock Products Co., and plans called for a capacity production of 125 cubic yards per hour at peak pouring. To speed the work further, the contractor used a streamlined Rex 34-E dual-drum paver which saved countless man-hours.

Forms were set to grades and locations established by string lines, following a general procedure of placing the middle lane of each 36-foot roadway first. On this initial form setup, the first halves of 2-section dowel tie bolts were installed at both form lines, leaving a threaded connector at the edge, so that the remaining halves could be screwed in when other lanes were placed.

The select subbase material was given a final blade dressing by a Lewis subgrader just after the cement stabilization was done, and

final grade was established for the concrete pavement by a shot of asphalt emulsion. There was usually at least a day's paving laid out ahead for the concrete crew, thanks to the generous assignment of forms to the job.

Paving work by the Rex dual-drum machine was conventional. The paver was spotted on the subgrade for the first center lane, and after that it could travel on finished concrete. Batch trucks followed a route which permitted them to reach the machine with a minimum of travel in reverse gear. Water for the mixing operation was available at several points from fire hydrants on the Los Angeles water line, and water was delivered to a paver-towed 3,000-gallon tank by two truck-mounted tanks. The concrete batches were mixed for 35 seconds

per drum and turned out on the subgrade at a slump of about 2 inches.

In the finishing lineup, in order, were a Jaeger concrete spreader, a Lakewood finishing machine, a Johnson longitudinal float finisher, several cement finishers, and a joint-sawing outfit. Two Viber electric vibrators, mounted on the rear end of the spreader frame, compacted edge concrete and turned out lanes which stripped perfectly when forms were pulled.

Pavement joints consisted of two types—formed and sawed. For the initial crack control, a conventional joint formed by steel wedge was made. This was done during the final dressing stage of the slab. From 36 hours to 4 days later, depending on weather variations, the 30 and 15-foot interval joints were sawed under an arrangement with Hurst Lewis,

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TEXACO

CONTRACTORS AND ENGINEERS

Inc., Pasadena, Calif. Still later, a multiple Concut Jointmaster saw with the new Foothill saw blade was used by Cecil Hatcher, Arcadia, Calif. The lane surfaces were cured by Hunt Process gray membrane curing solution.

Although lanes only 12 feet wide are the rule for paving in California, the Haddock organization consistently managed to hit 100-yards-an-hour production, and there were several peak days when 850 cubic yards were placed.

Automatic Batching

The Haddock organization, in line with usual practice when jobs are important, let a material-supply contract to Consolidated Rock Products Co. for the supply and batching of all concrete materials. Consolidated soon had a fully automatic

Noble batch plant and a 400-barrel cement silo set up at one end of the job, near the foot of Cahuenga Pass, and assigned trucks to haul sand and aggregate from its Roscoe commercial production plant in the San Fernando Valley.

Aggregates used on the job were: 1½-inch minus, ¾-inch minus, and sand. These materials were stored in separate stockpiles where each grade of material was available to a Bucyrus-Erie 38-B crane and its McCaffrey 2-yard clam bucket. This unit worked steadily to keep the bins charged as batching went on. The basic concrete mix included 470 pounds of cement, 1,440 pounds of sand, and 1,020 pounds each of the two sizes of rock aggregate.

Crescent magnetic valves automatically govern the opening and closing of doors under each feeder

bin on the Noble plant. Made by Barksdale Valves of Los Angeles, these units were fully efficient in dusty areas, gave trouble-free service, and eliminated down time. Another important feature is the metal ram on the main weigh hopper gate, which is regularly lubricated with graphite grease.

A fleet of seven GMC batch trucks, each hauling four batches per trip, was used by Haddock. These trucks delivered the dry batches from the Consolidated-operated Noble plant to the Rex paver at the job. Other trucks used included Fords and Peterbilt units with special 25-ton trailers, which were used for the transportation of Colton bulk cement to the batch plant.

Thus the last remaining section of the Hollywood Freeway, which now makes possible an unbroken run

between downtown Los Angeles and the edge of the San Fernando Valley, was completed. Eventually, the California Division of Highways expects to extend the freeway northward to a junction with the Golden State Freeway near San Fernando. The Ventura Freeway also will be extended westerly from the Hollywood Freeway.

Neal Saul, general superintendent for J. E. Haddock, Ltd., directed field operations for the paving contractor, and Ken Murray was job superintendent. Work for the California Division of Highways was under the general supervision of George T. McCoy, state highway engineer, with F. W. Panhorst as assistant state highway engineer, bridges. P. O. Harding, assistant state highway engineer, metropolitan area, is district engineer at Los Angeles. State engineers in the field included F. E. Sturgeon, resident engineer, and C. J. Verner, bridge engineer.

THE END

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Photo courtesy Gardner-Denver Co.

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Engineers Test Methods Of Controlling Floods

A two-week test of flood-fighting methods employed in the Illinois watershed was conducted recently by the Chicago District office of the U. S. Army Corps of Engineers. The imaginary rains and resultant flood conditions were exaggerated in an effort to tax flood-fighting facilities in the vast watershed.

As a result of the test, the existing methods of flood control are being augmented with newer and sounder techniques. These assure inhabitants of potential flood areas in a dozen river basins of organized and effective defense action in the event of an emergency.

Existing flood control systems in the Illinois watershed were built or restored at a cost of \$16,000,000 after the Chicago area's disastrous flood of 1943. Damage from the overflow of the Illinois River and its tributaries at that time caused \$15,000,000 worth of damage throughout the area.

The recent test of flood-fighting methods, known as Exercise Jupiter, was part of a nation-wide seasonal examination by the Army Corps of Engineers of the nation's ability to control floods. The country's flood control program has been under the jurisdiction of the engineer corps since the passage of federal control laws in 1923 and 1938, and canals, waterways, locks, dams, and other facilities have been built in an effort to prevent flood damage.

NCA Elects Kellogg Man

Edward R. McGonnigle, labor relations manager for the construction department of The M. W. Kellogg Co., has been elected to the executive committee of the National Constructors Association. Mr. McGonnigle, who has been with Kellogg for 16 years, will serve a two-year term on the committee.

Kellogg, petroleum and chemical engineering-contracting subsidiary of Pullman, Inc., is one of 20 companies comprising the NCA—an organization formed by chemical, petroleum, and steel plant contracting firms to study field construction problems and labor relations in the industry.



A traveling derrick with 150-foot boom and 40-foot jib prepares to land one of the falsework bents used to support the right-side section of the Missouri River span during dismantling operations. The machine, operated by an American 4-drum hoist, was converted into a floating rig by being locked into place on a float.

C&E Staff Photos



After the Koehring 604 crane, left, has moved the falsework bent to the sand platform, the floating derrick drops a line between the trusses to raise the bent into place. Then, as the truss members are cut free, they are picked off piece by piece.

WHEN THE GATES of Garrison Dam in central North Dakota are closed and the Missouri River begins to fill the huge reservoir, the backwater will inundate everything in the valley for many miles above the dam. Two towns and a bridge lie in the path of this man-made flood. Families and business establishments of the towns are being relocated at a new site appropriately called New Town. The steel truss bridge which carried highway traffic across the river at Elbowoods is being moved upstream for use in a new and longer bridge being built across the Missouri near the doomed town of Sanish.

Dismantling of the 1,425-foot bridge and transporting of the pieces by truck to the new site required

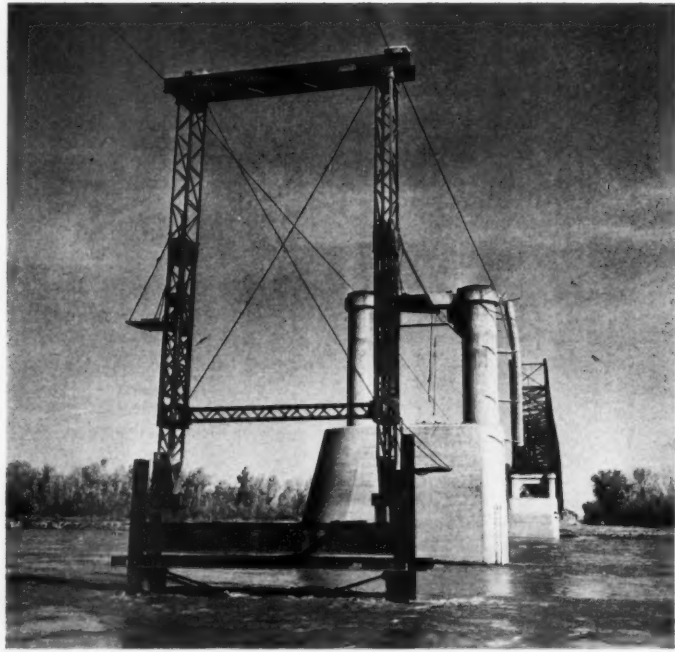
both skill and highly specialized equipment. A floating derrick with 190 feet of boom and jib and with a lifting capacity of 100 tons at a radius of 50 feet, together with a system of telescoping falsework bents, was the basic equipment. Skill was provided by the John F. Beasley Construction Co., Muskogee, Okla., which held the subcontract for dismantling, transporting, and erecting the bridge.

The new bridge at Sanish will be 4,482 feet long. It will contain 9 new deck-truss spans and 2 new deck girder spans in addition to the 1,425 feet of through-truss being moved upstream from Elbowoods. Substructures constructed by Massman Construction Co. and the Kansas City Bridge Co., both of Kansas

Floating Derrick Rig Dismantles Old Bridge

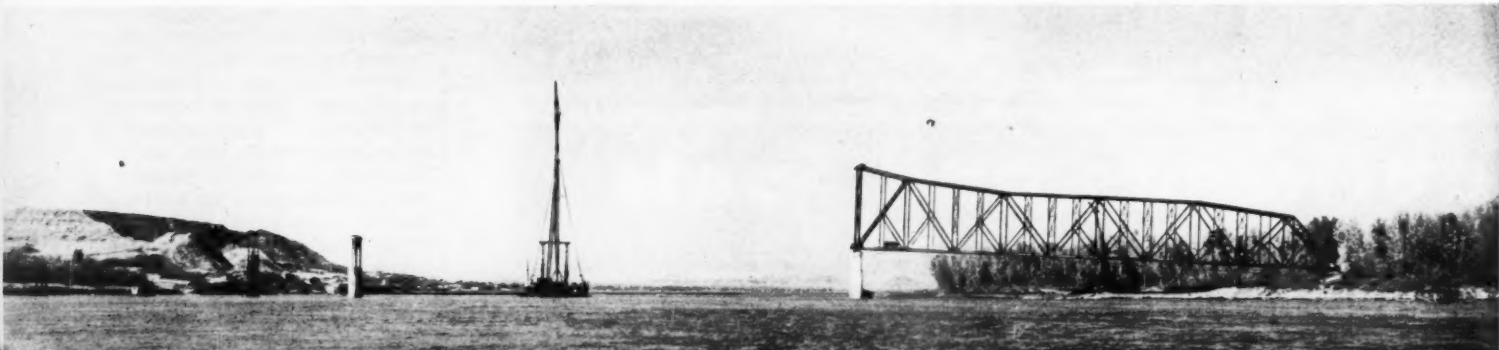
Portable bents support key panel points as trusses are salvaged for longer span

By RALPH MONSON, Field Editor



One of the telescoping falsework bents is supported on H-pile foundations after part of the span has been removed. Cables reaching from shore to shore and anchored to old piers, are attached to the top of the bent to hold it in place.

The floating rig returns to the landing with one of the falsework bents used in dismantling the span on the right side of the river. Only the left side of the span remains to be dismantled.



City, Mo., were completed early last November. Traffic should start flowing over the new structure by the fall of 1955, according to present schedules. General contractor for the superstructure portion of the project is Manhattan Construction Co., Muskogee, Okla.

Dismantling operations started June 10, 1953 and were completed early in November. Transporting of the truss members began as soon as they were removed from the structure and continued on into the winter until the last piece had been delivered to the new site.

Floating Derrick

The key piece of equipment was a traveling derrick which was a combination of stiffer and guy derrick. Its 110-foot mast was mounted at the middle of one leg of a heavy triangular subframe. The mast was braced backward to the vertex of the triangular base with a rigid leg. Cable guys from the top of the mast to the other two points of the triangle provided the side bracing.

A 150-foot-long boom carrying a 40-foot jib was attached to the base of the mast so that both the mast and boom could be rotated by a bull-wheel. Operating the derrick was a 4-drum American hoist powered through a torque converter by a Cummins diesel engine. The four main drums of the hoist and the auxiliary swing drum were all air controlled.

The subframe of the machine was carried on wheels running on a special track. For this operation, a section of the track was mounted on floats. The derrick was rolled from shore onto the floats and the wheels securely locked. Thus the rig became a floating crane. The floats were made up of welded steel pontoons 10 feet wide, 20 feet long, and 4 feet deep. Fifteen of these pontoons supported the front rail, while the rear was carried on six.

Motive power in the water was provided by three deck engines whose cables stretched across the river to heavy concrete anchors. Two of the anchors were placed on opposite sides of the river just above the bridge. The other two anchors were located about 500 yards upstream. The 1 1/8-inch cables from the upstream anchors were handled by two Bayard rope windlasses driven by Wisconsin engines. These winches were mounted on the subframe near each front corner, with the cables running through snatch-blocks at the rear.

An American 2-drum hoist driven by a Minneapolis-Moline engine handled the 3/4-inch cables attached to the downstream anchors. These lines were used primarily for turning and guiding the machine, while the upstream lines took the heavy pulling load. Operation of the winches in various combinations, together with the current of the Missouri, gave the machine complete mobility across the entire width of the river on the upstream side of the bridge.

This derrick erected the falsework bents under the bridge, picked off the truss members piece by piece as they were cut free by the workmen, and then removed the falsework. The operation was repeated for each

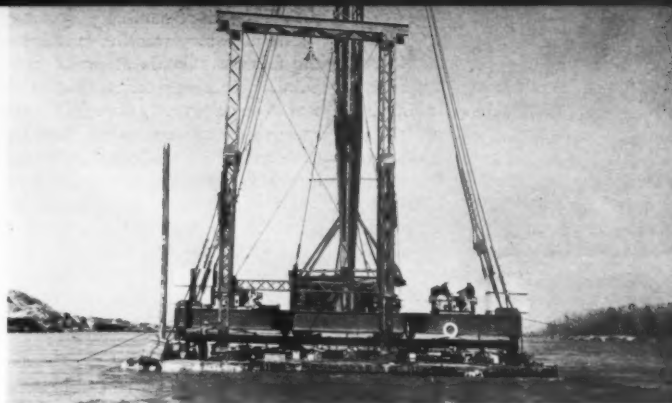
of the three spans of the bridge. When the bridge is re-erected at Sanish, these steps will be repeated.

Upon completion of the dismantling, the derrick was towed upstream to Sanish. Four sea mules with Cummins 275-hp diesel engines and a Missouri Valley 165-hp tug moved the rig in 8 days. At Sanish, track was laid on the west bank and the machine was moved from the floats to high ground, ready to start the erection job in the spring.

Break Concrete Deck

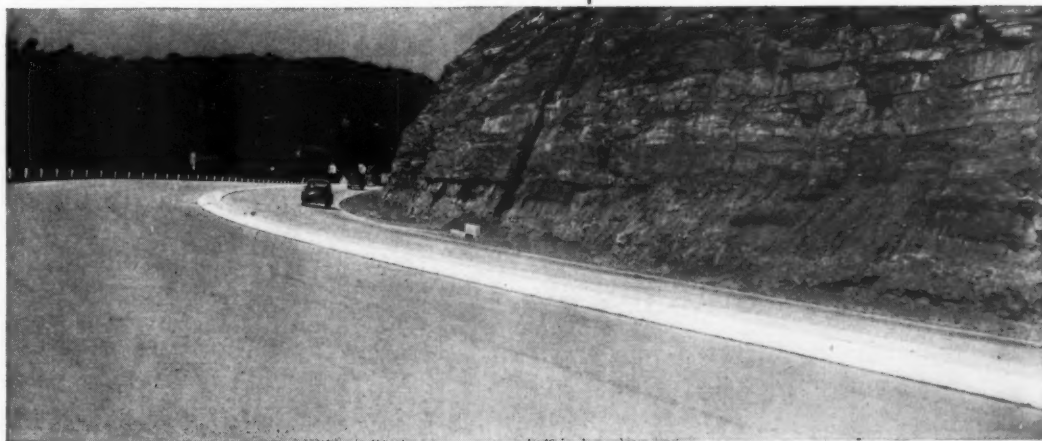
Removal of the concrete deck and guardrail was the first step in the dismantling project. A Link-Belt Speeder crane with 2,000-pound breaker ball broke up the rein-

(Continued on next page)



Bayard rope windlasses, driven by Wisconsin engines, pull the rig back and forth across the river on 1 1/8-inch cables anchored to the banks. John F. Beasley Construction Co. held the subcontract for this job. C&E Staff Photo

This highway was "winterized" when it was built — with DURAPLASTIC



Section of highway in Allegheny County, Pa., near Pittsburgh, built with Duraplastic. White concrete reflecting curbs made with Atlas White Duraplastic. Designed by Pennsylvania State Highway Dept. General contractor: Harrison Construction Company, Pittsburgh; paving sub-contractor: McCrady Construction Company, Pittsburgh; White curb installed by E. Arthur James, Johnstown, Pa.

Come freeze or thaw or de-icing salt, this section of highway near Pittsburgh is ready for the winter's worst, because the concrete was made with Atlas Duraplastic air-entraining portland cement.

Duraplastic makes more durable concrete because it minimizes segregation and bleeding. Thus, concrete is fortified against the effects of

freezing-thawing weather and the scaling action of de-icing salts.

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(Continued from preceding page)

forced-concrete deck, and the pieces were allowed to fall into the river. After carefully match-marking the joints, workmen cut out all rivets at joints which were to be disconnected, replacing some of the rivets with drift pins and bolts sufficient to serve as temporary connections while the structure was being dismantled. Boyer air chisels powered by 2 compressors, a Schramm 365-cfm and an Ingersoll-Rand 105, were used to

cut off the rivet heads.

The next step was the erection of the falsework bents at major panel points. Beasley's telescoping falsework bents greatly simplified and speeded up this operation. The legs of these bents are adjustable through a wide range of heights by the regulation of the basic telescoping section and the addition or removal of rigid sections. The adjustable section has a minimum height of 27.5 feet and a maximum of 39 feet. By simply adding leg sections, this maxi-

mum can be increased to any practical height. Greater carrying capacity can be obtained by doubling up the bents.

Falsework Bents

The telescoping leg sections consist of two latticed angle columns, one slightly larger than the other. One column has the lattice inside the legs of the angles, and the other has it on the outside. The sections thus fit snugly together. In use, the legs are extended to approximately the

required length, and jacking blocks are bolted securely to both sections. William S. Pine 150-ton hydraulic jacks operate between the jacking blocks to make the final adjustment of height after the bents are in place. A threaded rod 3½ inches in diameter joins the jacking blocks, and nuts on this rod are adjusted to take the load from the jacks.

Where the water was deep and the current rapid, a pile foundation was provided for the bents. Four steel H-piles, 14-inch at 73 pounds per foot, were driven through 12 feet of sand and as far as 35 feet into the underlying clay to provide bearing for the bents. Two templates made of channels held the piles in proper position, while double cross bracing between the templates stiffened the bent. A few feet above the water, two 36-inch I-beams were bolted to the piles to carry the foot-blocks of the falsework bent.

In the center and left-side spans, where the water was relatively shallow, mud sills of crisscrossed timbers were built to support the bents. Before setting any of the bents, a 1¼-inch cable was stretched completely across the river on each side of the bridge. The cables were securely anchored to the top of each pier and served to brace the falsework bents.

The long reach of the big derrick was especially valuable for setting the falsework bents. The long boom and jib enabled the machine to reach completely over the top of the bridge to place footing blocks or other heavy objects on the far side. With the jib extending above the bridge, a line was dropped between the bridge trusses to pick up the falsework bents and raise them into place.

Bents were pin-connected to the foot blocks and the tops were attached to the overhead cables. The hydraulic jacks then raised the upper section of the telescoping bent until it bore firmly against the truss, and the adjusting nuts were tightened to take over the load from the jacks.

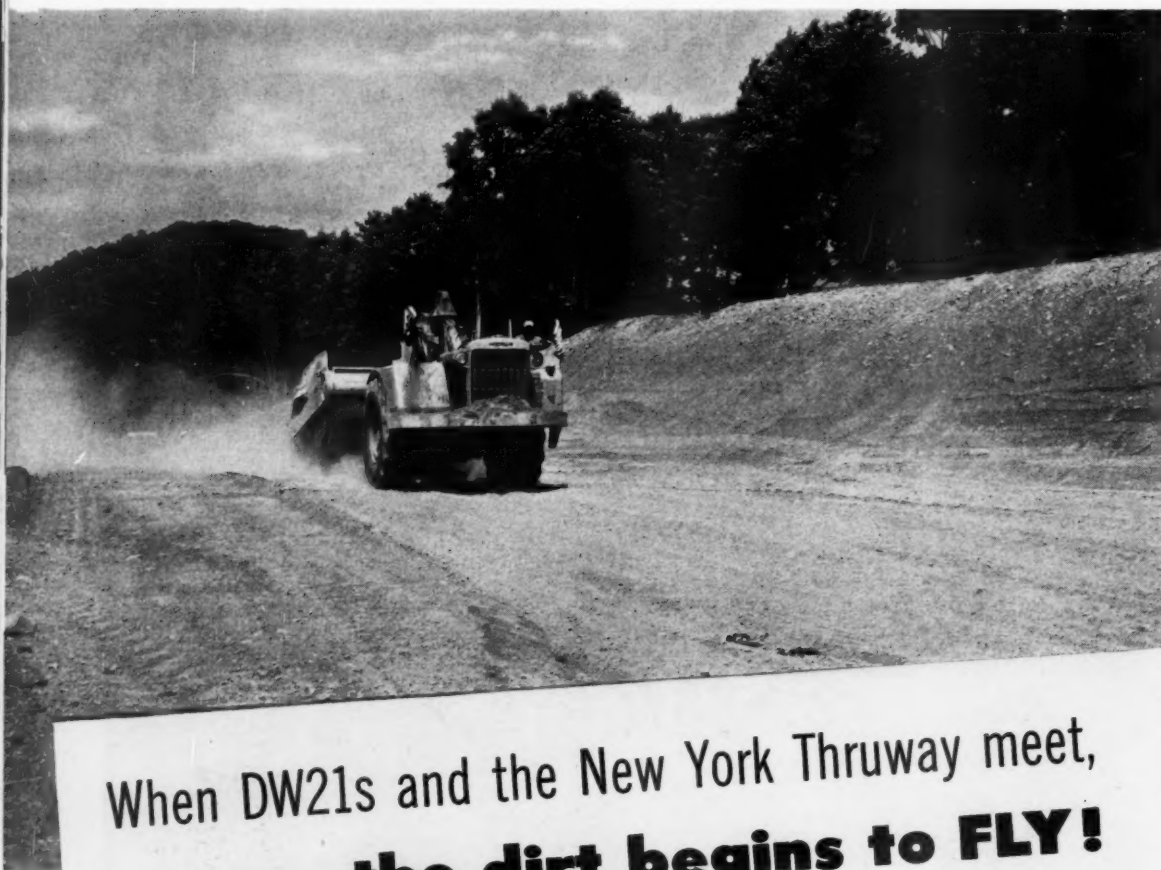
Once the falsework had been placed, the dismantling of the structure consisted of picking off the members in proper sequence so as to leave the remainder of the bridge self-supporting. The big derrick removed sections up to 93 feet in length and weighing up to 14 tons, and placed them on a waiting barge. When the barge was loaded it was pushed to the landing by a workboat.

On the shore, a Koehring 604 crane picked the pieces of steel off the barge and loaded them on truck trailers for the trip over the highways to Sanish. Federal trucks equipped with Cummins 200-horsepower diesel engines made two round trips daily carrying the long heavy loads over the 60 miles of gravel highway.

Under the left-side span, where the water was shallow and plenty of sand was available, a sand working platform was built up to an elevation of about four feet above water to carry the falsework footblocks. The sand was moved and compacted by an International TD-18A tractor equipped with Bucyrus-Erie dozer. For this span it was necessary to remove the leg extensions from the falsework bents.

The bents were brought to the

CONTRACTORS AND ENGINEERS



When DW21s and the New York Thruway meet, the dirt begins to FLY!

Here's the
record of these DW21s:

Soil—Sandy loam, clay and gravel
Haul—2300 feet
Trips per hour—9-10 trips
Load per hour per machine—180-200 yards
Hours used daily—8-10 hours
Loading time—1 minute
Spreading time—20 seconds (on the run)

THE New York Thruway, being built for speed, is being built with speed. The above record of fast-stepping, rugged Cat® DW21s explains why. Coupled with earth-eating No. 21 Scrapers and push-loaded by brawny Caterpillar D8 Tractors, the DW21s are making the dirt fly for Petrillo, Healy & Gammino, Providence, R. I.

L. DeLiro, grade foreman, sums up their impressive performance:

"Not only do these DW21s move the dirt fast, but they are easy to handle for our operators. The big tires float over rocks and ordinary haul roads with ease."

These machines were designed for big loads, high speeds and easy handling. Because tractor and engine are built to match by one manufacturer, you get a balance between weight and horsepower that no other two-wheel earthmover can offer. Every bit of the 225 HP at the flywheel can be put to work efficiently.

And the entire rig is matched to the operator. The DW21 has positive hydraulic follow-up steering system, making it as easy to steer as an automobile. Its 5-speed constant-mesh transmission saves time and energy for operators. They shift on the move without fumbling for the proper gear.

Now you can see the high-speed DW21 at work on your job. Just call your Caterpillar Dealer and name the date. He'll be happy to demonstrate.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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landing by the big derrick. Here a crew of men equipped with Chicago Pneumatic impact wrenches quickly removed the top chord, took off the leg extensions, replaced the cross-tie rods with shorter rods, and replaced the top chord. The Koehring crane handled the heavy sections and assisted the derrick in landing the bents. The crane then carried the shortened bents out over the sand platform to the points where they were to be erected.

When the entire truss had been removed, the concrete piers were blasted off down to the top of the pedestal section to make sure they would not be a menace to navigation after the lake was formed. Other equipment used on the project included an Allis-Chalmers HD-15 tractor equipped with dozer and Tractomotive side boom, which proved very useful in handling timbers and lighter steel sections. A GMC truck with Tulsa winch and rear-mounted A-frame was also given a workout on this job.

Personnel

Approximately 30 workmen under the supervision of D. J. Hewett, superintendent for John F. Beasley Construction Co., dismantled and transported the bridge. Of these, ten men under Foreman F. H. Rathert manned the floating derrick. General superintendent for Manhattan Construction Co. was Quay Franklin. Office manager was J. H. Twist. A Spartanette office trailer provided a neat and efficient job office which was easily transported to a new location at the termination of the job.

THE END

Hammermills, Inc., Move

Transfer of engineering, manufacturing, and sales operations for its complete line of Bulldog hammermills to Universal Engineering Corp. headquarters, 625 C Ave. N. W., Cedar Rapids, Iowa, is announced by Hammermills, Inc., subsidiary of Pettibone-Mulliken Corp., Chicago.

Taber Elected MRBA Head

The Michigan Road Builders' Association elected Harold J. Taber president for the current year at its annual convention in Detroit. Mr. Taber, of the Taber Co., Grand Rapids, took office at the banquet, which closed the two-day meeting.

Other officers elected by the association were Manley Osgood of the Ann Arbor Construction Co., Ann Arbor, vice president; A. M. Della-Moretta of the Alpine Construction Co., St. Ignace, Upper Peninsula vice president; and Glenn A. Comstock of the Comstock Construction Co., Bay City, secretary-treasurer.

Elected to serve a two-year term on the board of directors were Mario J. Calcaterra, St. Ignace; H. W. Douma, Petoskey; O. E. Gooding, Ypsilanti; Carl E. Goodwin,



Officers of the Michigan Road Builders' Association for the 1954-55 term are, left to right: C. J. Carroll, executive secretary; A. M. Della-Moretta, Upper Peninsula vice president; Harold J. Taber, president; Manley Osgood, vice-president; Glenn A. Comstock, secretary-treasurer; and Robert F. Browning, assistant executive secretary.

Allegan; C. A. Hull, Dryden; Frank Muehlenbeck, Saginaw; and Signor E. Loselle, Wyandotte; William J. Peterson, Detroit.

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EXCAVATING EQUIPMENT

Revolving Shovels —Part I

By HERBERT L. NICHOLS, JR.

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REVOLVING SHOVELS made their first appearance in 1835 in the form of a part-swing dipper shovel mounted on railroad tracks. It was powered by steam, it was slow and clumsy, but it did the work. As the years went on, shovels gradually became stronger, faster, and lighter. During the last 50 years they have sprouted a variety of new attachments and have left the tracks to walk on crawler tracks and rubber tires. Every year they encounter more competition from other kinds of machines, but they are still the basic tools for earth-moving.

There are five shovel attachments (also called rigs or fronts) which have primary importance. They are known best under the names dipper shovel (or dipper stick), backhoe, dragline, clamshell, and crane.

Small shovels use gasoline, diesel, or electric engines, with mechanical drive to all moving parts. Large shovels may use diesels, with mechanical or electric drive, or several electric motors supplied from "high lines" through a cable.

Shovels of ¼-yard size and smaller may have an engine transmission with two or more speeds. The high speed is intended for traveling or exceptionally light and open work. In addition, the governor may be provided with a special setting to speed the engine while the equipment is walking.

Controls are different in each make of shovel. Many use vacuum, air, or hydraulic controls, with shorter operating levers. Steering brakes are generally used to hold for digging also and may be applied by hand or automatically. The direction of throw of operating levers can often be reversed.

Lubrication

Most of the deck machinery may be enclosed in oil-tight cases and lubricated by gears dipping oil out of one or more reservoirs and carrying it to distribution points, from which it flows over the other gears and bearings and back to the reservoirs. The oil level should be checked frequently by removing inspection plugs, and sediment should be drained from the bottom sumps occasionally.

The turntable gear is lubricated by pouring heated crater compound through a hole in the floor over the gear, while the shovel revolves. This gear should be inspected at least once a day and greased when bright spots appear on the teeth.

Pressure-gun fittings throughout the shovel are greased in accordance with a schedule supplied with the machine. In general, bushings require more frequent attention than antifriction bearings, some of which may be sealed so as not to require lubrication. The crowd chains for the dipper stick should be kept painted with oil or light grease, but the tracks and drive chains should be left dry.

If the deck machinery is not in enclosed cases, the gears are usually greased with crater compound. Small applications are recommended, as surplus works down to the floor, where it may combine with dirt to build up hard deposits which will obstruct the horizontal gears. If it gets in the underbody, it may cause jaw clutches to stick and spoil traction brake linings.

Carrying Mechanism

Track pads are available in several widths. Wide tracks hold the machine up better on soft ground, but they somewhat increase the effort of steering and are more subject to severe twisting stresses on uneven ground. They are heavier and more expensive and cause complications by increasing the over-all width of the machine.

Extra-long tracks increase stability and are desirable for long-boomed machines and those which must handle heavy loads. Flotation can be greatly increased by placing supporting platforms on the ground.

Both the tracks and the drive chains wear and need periodic adjustment. Bull wheels and idlers

This is the first in a series of articles made up of excerpts from the book, "How To Operate Excavation Equipment", by Herbert L. Nichols, Jr., published this spring by North Castle Books, Dept. N, 212 Bedford Road, Greenwich, Conn. In this and succeeding articles, CONTRACTORS AND ENGINEERS will publish sections dealing especially with the uses and adaptability of various pieces of earth-moving machinery, as well as with the care and safe operation of equipment.

While much of this material is basic to experienced contractors and their staffs, the series is intended as an easy reference for all who work with excavating equipment.

are mounted so they can slide backward and forward on the truck frame fastenings, and the position of each is fixed by heavy bolts. Lengthening the front bolts will force the idler forward and tighten the track only, while lengthening the rear bolts will force the bull wheel and sprocket backward and tighten both the track and the drive chain. Care must be taken not to turn a wheel sideward by unequal adjustment of paired bolts, as it will then tend to walk out of the track.

Any standard truck chassis of sufficient rated capacity can be used to carry a shovel, although considerable extra bracing is required, and better service should be obtained from a chassis specially engineered for the shovel. Tandem drive gives best support, and all-wheel drive is advisable in work where mud or sand may be encountered.

Outriggers may be used to increase stability. These may be beams which can be slid or folded out of the bumpers, usually only at the rear, and which are supported by blocks or jacks. They provide a much larger and more rigid base than the tires. When they are used, lifting capacity is greater than that of a crawler of the same size, particularly when working off the back so that the truck engine acts as a counterweight.

The advantage of truck mounting is its capacity for rapid and inexpensive movement from one job to another. With many models, the shovel can be placed and locked in traveling position in less than a minute and then moved along roads at 20 to 35 miles per hour.

On the job, however, the truck-shovel suffers from lack of maneuverability. Instead of turning in nearly its own length, as the crawler, it must have considerable space in which to turn or side-step.

Its most important weakness for excavation work is the ease with which it can get stuck. Even with all-wheel drive, its ability to get in and out of soft spots is greatly inferior to that of a crawler, and with rear drive only, constant care must be exercised to keep it out of trouble in soft ground and during rains. This disability has little effect on its usefulness when equipped as a crane, since most of its work can then be done on pavement.

Dipper Shovels

The dipper shovel is the ideal machine for loading trucks. It is accurate because of the three-way control of the bucket and the ability to dump in any position. It is fast because only a small part of its weight

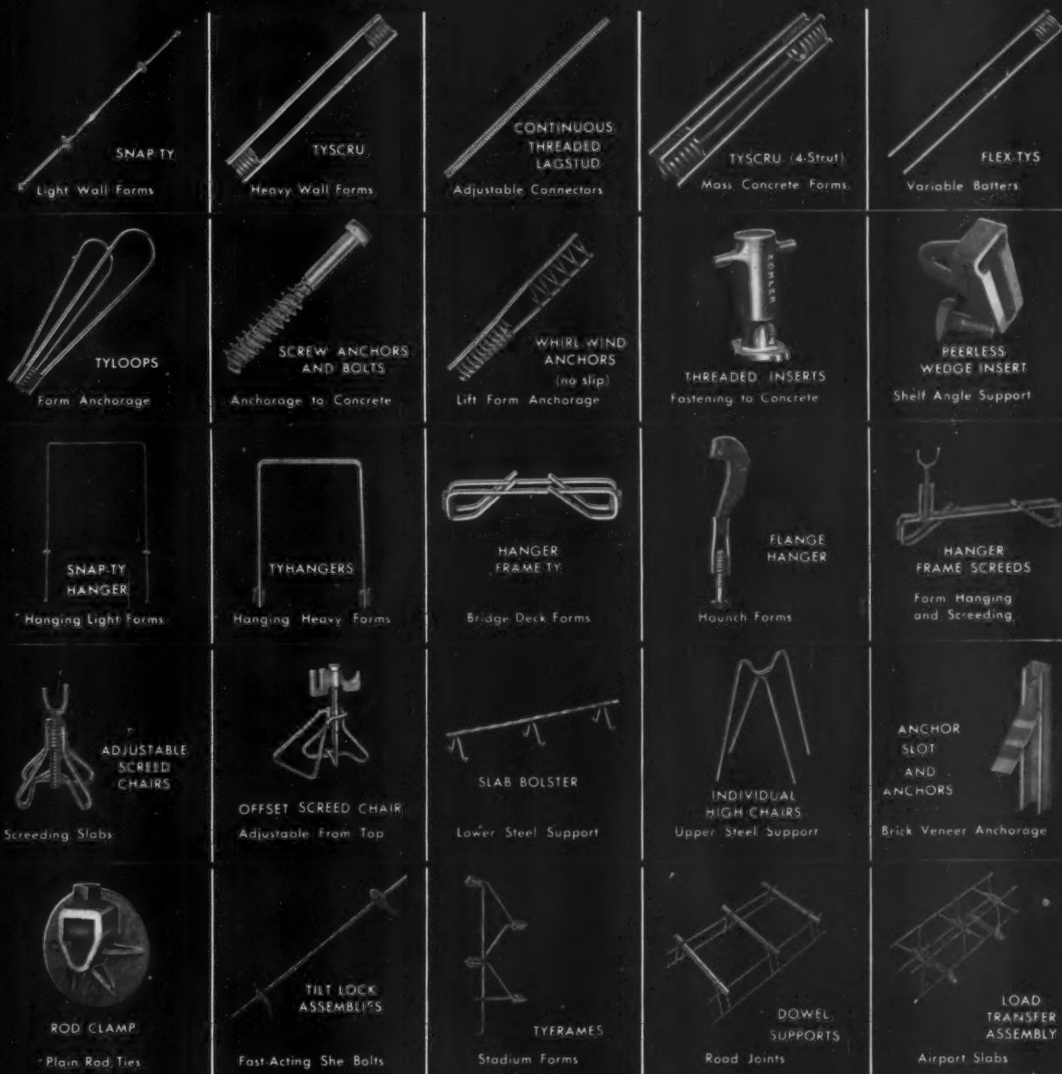
—the stick and bucket—are involved in the digging motion, and because of its ability to dig in any spot, it can reach with minimum waste motion entering and leaving the cut.

The dipper is also the attachment for hard heavy digging—hardpan, boulders, ledge, and blasted rock. The weight of the boom, backed to a varying extent by the weight of the shovel itself, holds the bucket to its work. The effective cutting angle of the teeth in a bank, aided by the variable direction of pressure provided by the hoist and crowd, enables it to cut highly resistant material and to break up cracked

and fissured rock formations. The shape of the bucket enables it to pick up objects much larger than itself without chaining. Larger size shovels are increasingly effective at this type of work.

However, it is necessary that the shovel be able to move into its work constantly in order to retain its effectiveness. Solid rock projecting from the pit floor will prevent getting at the bank unless ramps are built over the rock or bulldozers used to push the bank to the shovel. In digging below the tracks, the down-slope should not be much over 20 per cent if the machine is to follow

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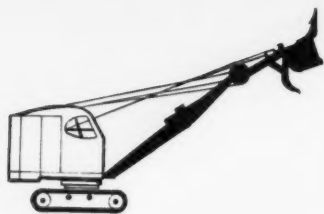
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the work. If it is to stand at the edge and dig, it can cut down steeply 5 to 7 feet but is limited as to width of cut, and unless digging against a bank, may push away about as much material as it picks up. Narrow ditches can be dug effectively only in ground free from large boulders which would tear up the ditch sides, and firm enough so that the shovel can be worked straddling its ditch, with or without platforms.

Shovel cables are subject to shock, heavy loads, sharp bending, rapid motion, and exposure to weather, and drag cables may be exposed to friction with earth and rock. They may last a few hours or for years, but sooner or later they will break unless replaced. If the break occurs during work, time is lost until another cable can be obtained and installed. If the break occurs at the wrong time, it may cause injury or death to personnel and damage to property.

An operator should lower the

bucket to the ground before leaving the machine, as the brakes may lose their grip as they cool and let the bucket down, gradually or with a rush. There is also the possibility of a would-be operator accidentally releasing the hoist brake while an admiring friend stands under the bucket.

Workmen and spectators should always keep beyond the furthest reach of the shovel, if possible, but they seldom do. A point to remember when in danger of being hit by the bucket is that a shovel is weak on the infighting and that it may be safest to run toward it where the slower speed of its motion makes it easier to dodge and less damaging if it does connect.

The production of a shovel cannot be predicted accurately because of the many variables in the machines, operators, and soils. It will be increased if the swing angle is reduced, if the soil is easier to dig or heaps higher on the bucket, or if average time loss is reduced. It will be reduced if the shovel must wait for trucks to get in position, if the bank is so low as to require frequent moves, if loading must be done at a higher level, if the digging is obstructed by roots, stumps, or boulders, or is too hard to yield a full bucket with each pass, and if the swing is longer than 90 degrees.

As digging becomes hard, the output of small machines drops faster

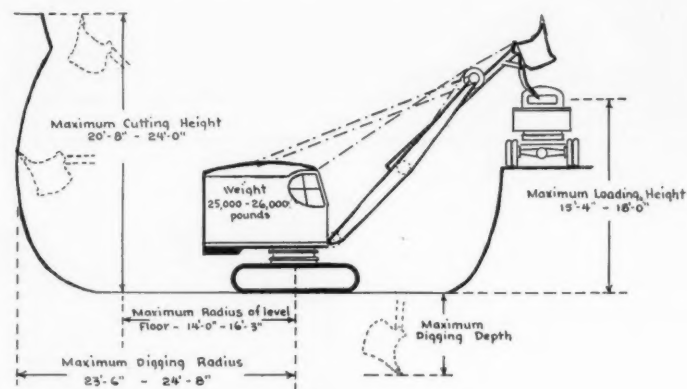
than that of larger ones. In cramped spaces, with limited working room, output of large shovels falls off more than that of the small ones.

Non-caving or slow-caving banks should not be higher than the shipper shaft, nor less than half that height, for best results. If the soil is hard, the higher bank may be

from 20 to 100 per cent over truck loading, as output can be continuous, without pauses for accurate spotting. Large trucks are more quickly loaded than small ones if body walls are not inconveniently high.

Pull Shovels

The pull shovel, also known as a



Weight, range, and speed of dipper shovel.

advantageous as it gives longer contact for the bucket, so that it can fill from a thinner slice.

Banks that slide freely as the toe is dug away give best loading conditions and are limited in height only by danger of heavy slides.

Side-casting will increase output

hoe, backhoe, dragshovel, or ditching shovel, is at its best digging below the level on which it stands. This machine is particularly vulnerable to having the boom fall back. Either the hoist or drag, if engaged too long, will pull the boom back on the jack boom, and both of them on top



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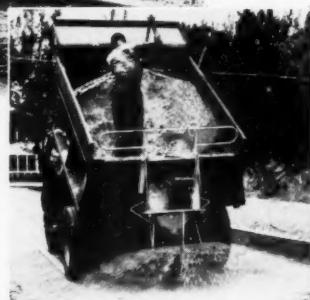
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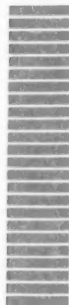
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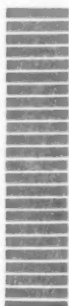
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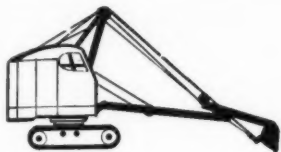
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of the cab. Also, if the shovel does not stand level, a boom and bucket in a position which is safe on the low side may fall back on the cab when it swings to face uphill. A warning of this is a slackening of the drag cable; a cure if it is not too late is to release both brakes and let the boom down and the bucket out until balance is restored.

A structural safety measure is to hinge a piece of pipe to the A-frame, and another to the jack boom, of such sizes that one will slide inside the other. A stop pin may be put in either to prevent them from telescoping together far enough to allow the jack boom to touch the cab, without interfering with normal use. If the A-frame is the folding type,



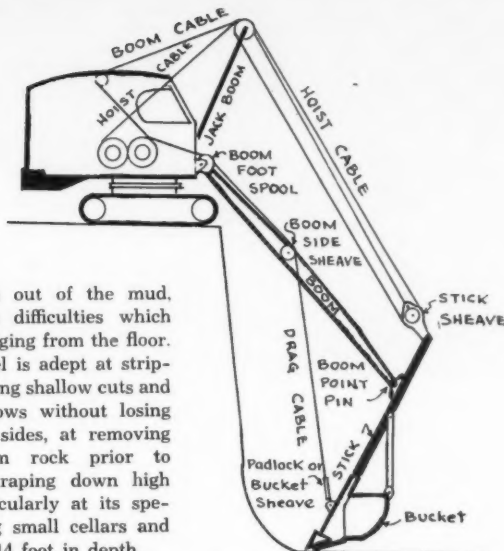
it may require bracing.

The pull shovel shares with the dipper stick the advantages of a rigidly attached bucket, with resultant control of digging, and ability to hold the bucket teeth to their work. In addition, it is able to work below the grade on which it stands, keeping itself and sometimes

attendant trucks out of the mud, rock, and ramp difficulties which often hamper digging from the floor.

The pull shovel is adept at stripping topsoil, making shallow cuts and removing windrows without losing material at the sides, at removing overburden from rock prior to quarrying, at scraping down high banks, and particularly at its speciality of digging small cellars and ditches to 12 or 14 feet in depth.

However, it is sloppy and inefficient at loading trucks and has a slow digging cycle. The sloppiness is due to material falling off the teeth as the bucket is lifted toward dumping position, and the inefficiency results from the maneuvering necessary to complete a dump within the length of a truck body. The slow cycle is partly because of the carrying of the extra weight of a boom in digging motions and largely because of the necessity of pulling the bucket close into the boom before hoisting, in



The hoe or pull shovel works below the grade on which it stands.

order to retain the load during the hoist.

There are so many variables in hoe operation that a table of output would be of little use. Yardage may run from 50 to 80 per cent of that moved by a dipper stick, under conditions favorable to both machines.

(TO BE CONTINUED NEXT MONTH)

Missouri Road Will Join Turner Turnpike Extension

The Oklahoma Turner Turnpike's northeast extension, one of three toll roads authorized in an election last January, will tie into a four-lane road running from the Oklahoma border to Joplin, Mo. According to plans of the Missouri State Highway Commission, the road will run from Joplin southeast to the border.

The two other turnpike extensions will connect with the Turner pike at Oklahoma City. One will run to the Kansas border in the north, and the other will stretch south to the Texas border opposite Wichita Falls.

Hanisch Is Head of AITC

Max C. Hanisch, Jr., president of Unit Structures, Inc., Peshtigo, Wis., was elected president of the American Institute of Timber Construction at its annual meeting in New Orleans. Vice president of the institute for the past two years, he succeeds Ward Mayer, general manager of Timber Structures, Inc., Portland, Oreg.

Charles C. Calvert was elected vice president of the institute, and T. C. Combs was re-elected secretary-treasurer. New directors include Frank B. Benzon and George H. Schweitzer.



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Workmen assemble Armco Multi-Plate pipe for the railroad tunnel through the new levee. The 15-foot-diameter pipe was constructed on a compacted backfill base, and the 20-foot fill was then built around it to the level of the rock levee in the background.

Unique Drainage Plan Protects Quarry Yard

Levee carries runoff pipe across working area to river; 15-foot-diameter pipe forms tunnel for railroad track

WHEN THE NATIONAL Lime & Stone Co. sought to expand its quarrying operations at Lima, Ohio, the company found it necessary to extend flood-protection facilities. Flooding during heavy rains was a real threat

to the expansion program, since the quarry floor is 45 to 50 feet below the bed of the adjacent Ottawa River.

Today a unique drainage system checks flooding in the area. A 60-inch runoff pipe laid across a 20-foot levee not only protects the quarry but also provides for the safety of future residential developments in the area.

The installation consists of 840 linear feet of bituminous-coated corrugated-metal pipe carrying excess water over the quarry to the river. The conduit rests on a fill levee which cuts diagonally through the center of the quarry area to the river. This levee was built up along the route of a small creek which had to be diverted when quarrying operations were expanded.

The original quarry area was protected on three sides by 20-foot levees, and the fill to carry the drainage pipe was built up to this level. Quarry operations continued all during the time the drainage system was being constructed.

A narrow-gage track over which raw stone is hauled from the quarry face to the crusher plant runs through the quarry yard, perpendicular to the new levee. To accommodate this facility, a 260-linear-foot tunnel of 15-foot one-gage Armco Multi-Plate pipe was constructed to cut through the levee. A trench 2 feet deep, 8 feet wide, and

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Texture of material just as it left the pugmill.

Road rolls out without bringing fats to surface.

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EVERYONE has watched a mason trowel concrete and noted how the action brings the water and fats to the surface. This is typical of the movement of a flat blade in surfacing a mix bonded by a liquid.

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Overlapping action makes a tight joint by carrying the material up to and compacting it against the parallel course eliminating the constant hand work of carrying shovel loads back to fill cracks.

To these advantages add the Fluid Level that will assure both absolute uniformity in thickness and vastly improved uniformity in density along with a definite reduction in waste of materials now going into the hollows.

If you haven't seen the little booklet, "Put A Level On Your Roads," ask for it. It has some new thinking on road building.



ADNUN BLACK TOP PAVER

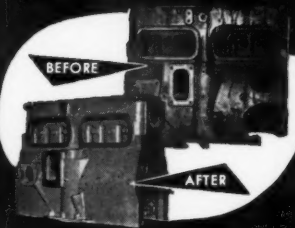
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CONTRACTORS AND ENGINEERS

A view of the completed railroad tunnel through which runs a narrow-gage track for transporting quarried rock to the crusher plant. The drainage pipe runs along the top of the new earth levee to the river.



260 feet long was first excavated across the line of the proposed levee. An 8-inch course of porous backfill was then compacted in the trench, and the tunnel pipe was laid on this fill. The levee was then built up around and over this track tunnel.

The new track was laid through the tunnel on a crushed stone fill 2 to 2½ feet deep. Ends of the tunnel pipe were cut to a 2 to 1 slope to match the grade of the levee.

Overhead, the drainage pipe carries the runoff that formerly made up the creek flow. The pipe is eight-gage Armco asbestos-bonded pipe. Its 26-foot lengths are connected at 33 joints with watertight bands of 10-gage metal. The conduit can carry 34,700 gallons of water per minute, a flow equivalent to 31 per cent runoff during a storm of one inch rainfall per hour. The pipe starts at a concrete headwall outside the quarry area and runs across the fill levee, through 65 feet of 67¼ feet of twelve-gage Armco tunnel liner in the old-river-bank stone levee, and thence to the river. A tide gate prevents the river water from backing up at high tide.

The quarry yard fill was laid by Earl Blausey, excavation contractor of Woodville, Ohio. All work was done under the direction of S. R. Friesner, general superintendent, and J. R. Joseph, plant superintendent, both of the National Lime & Stone Co. S. D. Downing, Bowling Green, Ohio, civil engineer, was responsible for engineering design and supervision.

THE END

Record-Breaking Road Act Is Signed Into Law

The largest federal-aid appropriation in history was authorized last month as President Dwight D. Eisenhower signed the Federal-Aid Highway Act of 1954 to make almost two billion dollars available for highway construction between 1955 and 1957.

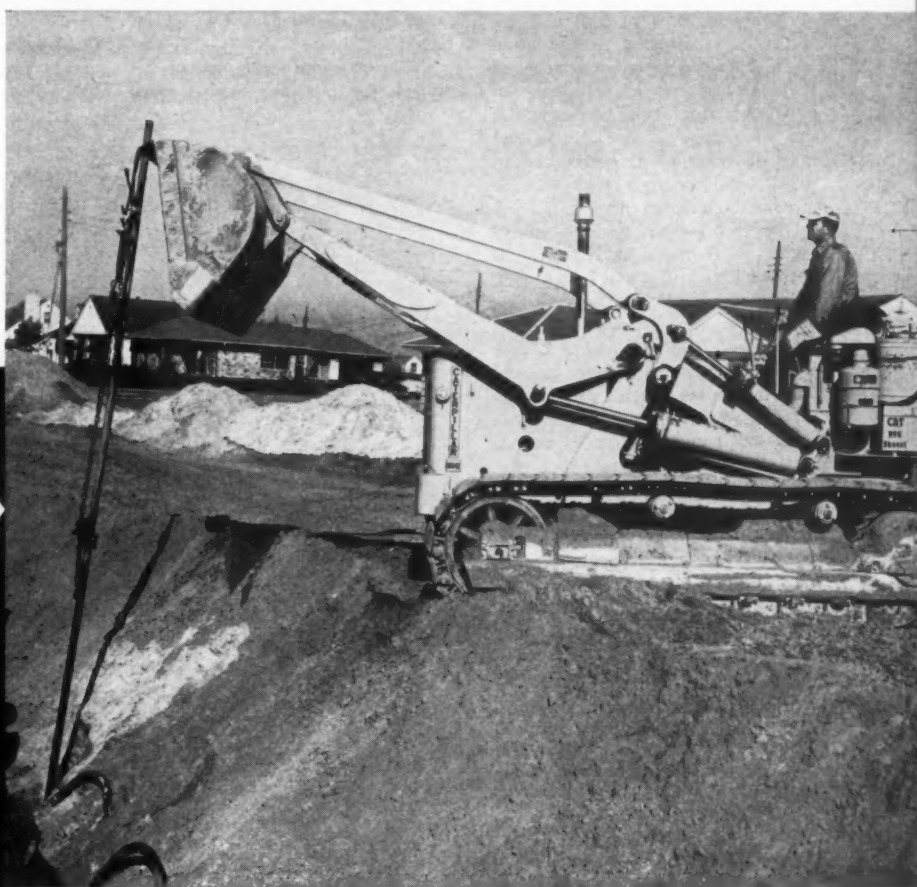
Of the total, \$875,000,000 will be in the form of federal aid to the states. Federal roads and Pan-American roads will take up the remaining \$91,000,000.

In signing the bill, the President said that this legislation "keeps in the states . . . primary responsibility for construction. At the same time, it recognizes the responsible relationship of the federal government to the development of a sound nation-wide highway system."

With today's highway needs only too apparent, the President stated, he was pleased with the law which will "increase considerably the scope and pace of our efforts to make up our highway deficiencies".

JUNE, 1954

Still
another
use
for
the
CAT* No. 6
Shovel!



...LIFTING WELL POINTS

The Caterpillar No. 6 Shovel was *designed* to be versatile—and users are still finding new jobs for it.

In Minnesota, the Phelps-Drake Company of Minneapolis installed a 30,000-foot sewer for the villages of Edina and Richfield. Well points, driven to a depth of 22 feet, were used to de-water the trench area down to the pipe grade line. How did they get them out? Let J. S. Hazlett, Jr., treasurer, explain:

"We used the No. 6 Shovel. The lifting of well points is a new application for this equipment and worked out surprisingly well. The operation, in the past, was delegated to draglines. But on this job, moving a heavy crane over soft sewer line fill would be difficult. Using a dragline, we would have to back-track and put lawns and walks back into shape. In addition, we would be taking the drag off important sewer line laying. *The No. 6 Shovel is a jack-of-all-trades, capable of doing a wide range of jobs.*"

On this job, the rugged Caterpillar unit was also used for backfilling and loading.

This workhorse, with its two-yard bucket, moves fast, dumps cleanly and returns in a hurry for the next load. The No. 6 Shovel can handle excavating jobs from initial digging to finished grading.

Ask your Caterpillar Dealer to demonstrate the No. 6 Shovel on *your* job—you'll discover a machine that will do more jobs at lower cost than any comparable unit on the market.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®



Binder and Rock Asphalt Resurface Old Blacktop

An International L-170 dump truck delivers a load of the open-graded binder mix to the Adnun paver. At right, a Buffalo-Springfield 10-ton tandem roller makes the initial compaction. C&E Staff Photos



RESURFACING with two courses of open-graded binder and a seal coat of Kentucky rock asphalt has resulted in satisfactory rehabilitation of old blacktop surfaces on some of Indiana's less traveled highways. An unusual feature of the work was the use of only one size of washed crushed limestone aggregate and an RC-5 cutback asphalt bitumen in the mix for the binder courses.

One such project was the resurfacing of 17 miles of Highway 29 between Burlington and Logansport. C. A. Studebaker Construction Co., Uniondale, Ind., was the general contractor. The new mat is 22 feet wide and was laid over the old blacktop after such preliminary grading work as widening, realignment and superelevation of curves, and elimination of sags.

The contractor widened about four miles of the route by excavating a trench a foot wide and 14 inches deep beside the old pavement. An 8-inch layer of crusher-run limestone was first placed in the trench, and the remaining 6 inches then built up with the same binder used for the resurfacing. Wedge courses of this same mix were placed to correct sags and improve superelevation of curves. The material was dumped on the road and spread with motor graders.

Mixing Binder

Binder material was mixed in a Hetherington & Berner paving plant owned and operated by McMahan Construction Co., Rochester, Ind., and erected on a site about four miles east of Logansport. Aggregate for the mix consisted of washed crushed limestone graded from a maximum of 3/4 inch with 0 to 5 per cent passing the 1/4-inch screen. The stone, delivered in trucks from the washer at a nearby quarry, contained a high percentage of moisture.

A Lima Paymaster crane with Omaha 3/4-yard clamshell bucket stockpiled the aggregate and charged the feeding hopper. Reciprocating gates on the hopper discharged the material into the cold elevator, which in turn discharged into the dryer. Because the material was to be mixed with an RC cutback asphalt, it was necessary to hold the heat in the dryer to the minimum which would remove the moisture. Average temperature of the material feeding out of the dryer to the hot elevator was around 225 degrees.

From the hot elevator, the stone was discharged directly into the hot bins, since no screening was required. Batches of 2,400 pounds were weighed out and mixed in the pug-mill, which then discharged into dump trucks. Cutback asphalt was received from Standard Oil Co. at

Whiting, Ind., in 4,500-gallon truck transports, and was stored in an 18,000-gallon tank heated by steam coils.

At the extreme south end of the project, the mix was hauled more

than 20 miles by a fleet of 14 rented dump trucks. As the work approached the northern end and the haul became shorter, 11 trucks were used. The mix was delivered to the road at a temperature of about 180

degrees and was laid by an Adnun paver. To save moveback time, the paver laid one course of the binder half the width of the roadway in a continuous stretch for three to four miles. The machine was then moved

Would You Like To INCREASE Scraper Rope Service?

Others Have!... by switching to:

Tuffy
SCRAPER ROPE



Wheel Scrapers Need a wire rope that is flexible enough to withstand sharp bends over small drums and hug sheave grooves... stiff enough to resist looping and kinking when slack. TUFFY SCRAPER ROPE users report greatly increased service after switching to Tuffy.

Tuffy Is Specially Constructed for the purpose of absorbing the many and varied stresses imposed by wheeled scrapers! Strands are pre-shaped to give *Longer Life*—the strength of every strand is concentrated on carrying the rope load, thus a balanced construction. This special design allows TUFFY SCRAPER ROPE to resist drum crushing abuse and the strains caused by angle pulls through swivel-mounted sheaves.

No Complicated Specifications are needed when you order. Just state the length, diameter and "TUFFY SCRAPER ROPE". See for yourself how TUFFY SCRAPER ROPE can pay off for you!



Tuffy
Slings

9-part machine-braided wire fabric. Will not materially damage fabric when kinked or knotted! Favorite with those that demand safety and lower costs!



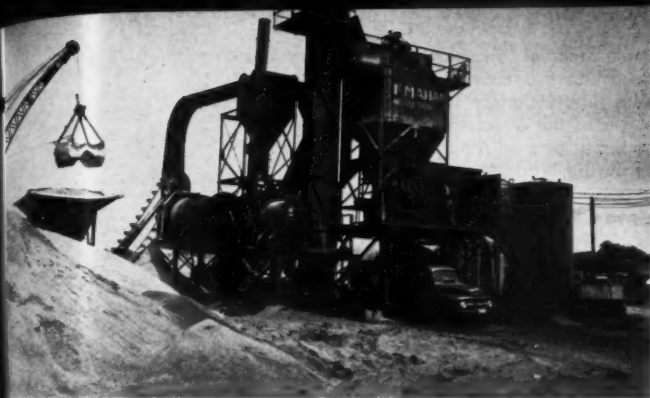
Tuffy
Hoist Line

Designed to give you the utmost in service, Tuffy Hoist Line is tailor-made for use on OVERHEAD, STIFF LEG and MOBILE CRANES, CLAMHELLS and DERICKS.

Tuffy
Dragline



Designed to give maximum abrasive resistance and flexibility! Rides better on grooves, hugs drum when casting!



Binder course material is mixed in a Hetherington & Berner asphalt plant near one end of the 17-mile blacktop project in Kentucky.



A wedge of earth is placed by an Apsco 85 shouldering machine to bring the shoulder up to the new surface.

back at night so as to be ready to start on the other half or the next course. Daily production varied from 650 to 850 tons.

A Buffalo-Springfield 10-ton tandem roller followed closely be-

hind the paver, giving the mix its initial compaction. After allowing about 24 hours for aeration of the mix, the mat was rolled the following day by a Buffalo-Springfield 12-ton 3-wheel roller. During this

time, the road was closed to traffic, as the mix would adhere to automobile tires even after the first rolling. Water supply for the rollers and the paver was drawn from nearby creeks and maintained by a Dodge truck

equipped with a 1,000-gallon tank and a Rex 2-inch pump. The same truck also carried a 300-gallon gasoline tank and hand pump for refueling the paver and roller engines.

The two binder courses were each laid at a rate of 100 pounds per square yard, giving a total compacted depth of approximately two inches. The finished surface of the binder was then shot with RC-4 cutback asphalt at a rate of 0.3 gallon per square yard. Limestone chips graded from 1/4 inch down were spread on the surface at 10 to 12 pounds per square yard, after which the surface was broomed and rolled with both rollers until the voids in the binder were closed.

This surface was primed with less than 0.1 gallon per square yard of RC-2 before application of the final course. Kyrock, natural rock asphalt containing 6 to 7 per cent asphalt and pulverized to pass the No. 4 screen, was spread at a rate of 45 pounds per square yard. Two rollings at 24-hour intervals completed the compaction of this course, leaving a watertight nonskid surface.

On this 17-mile job, approximately 28,000 tons of binder and 5,000 tons of rock asphalt were placed. The contract price for the project was approximately \$250,000.

Personnel

Frank Pearson was in charge of the project for Studebaker Construction Co., with Merle Studebaker directing activities at the asphalt plant. The work was done under supervision of the LaPorte District of the Indiana Highway Commission, with Paul B. Manson as district engineer. Eugene M. Kelley was project engineer. THE END

M-C & S Promotion

The appointment of G. Guy Owens as assistant to the vice president in charge of procurement, insurance, and subcontracts has been announced by Merritt-Chapman & Scott Corp., New York, N. Y. Mr. Owens' duties will entail the purchase and expediting of materials to industrial, building, marine, and heavy-construction projects the New York firm has under way here and abroad.

For the last three years, Owens has directed procurement of materials for a U. S. Air Force Base project at Goose Bay, Labrador, under construction by Merritt-Chapman & Scott and another contractor. He first joined the company in 1927 as a purchasing agent, and during World War II supervised purchasing of much material for overseas military construction.



Scraper work, such as building this farm-to-market road, puts much strain on rope ... causes stresses that ordinary wire rope just can't take for long. TUFFY

SCRAPER ROPE is specially pre-shaped to apply the full strength of every strand to the rope load!

Highway construction jobs often run into tough spots like this water-filled pot hole. Moving the heavy, gummy clay to fill it for a good road bed imposes a terrific strain on scraper rope. On jobs like this the flexibility and super strength of TUFFY SCRAPER ROPE really pays off.



The power of a crawler in front and back of a scraper is needed in some cases to hack out the dirt when preparing runways for jet planes. TUFFY SCRAPER ROPE plays a most important part. Its long life does away with expensive downtime caused by rope failure. The construction of TUFFY SCRAPER ROPE is so designed to give you long and economical service!



Tuffy Dozer Rope

Combined with proper cut-off procedure, TUFFY DOZER will greatly increase your service life ... cuts downtime. Available in 150' lengths 1/2" and 9/16" diameter.



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Specialists in High Carbon Wire, Wire Rope and Braided Wire Fabric

NAMES IN THE NEWS

ASCE Unit Names Gould Engineer of the Year

The Metropolitan Section of the American Society of Civil Engineers has named Richard H. Gould Metropolitan Engineer of the Year in



Richard H. Gould, Metropolitan Engineer of the Year.

recognition of his "inventive development in the art of sewage treatment" as shown by his "progressive construction of treatment works" for New York City. Mr. Gould has achieved wide recognition for his development of treatment methods here and abroad.

A resident of Douglaston, Queens, and an ASCE member for 20 years, Mr. Gould is now associated in New York with the Chicago consulting engineering firm of Greeley & Hansen. He held top technical supervisory positions in New York City for 25 years, retiring recently as director of the Division of Sewage Disposal for the city's Department of Public Works.

In that capacity, he supervised the design, construction, and operation of ten large sewage treatment works, costing about \$144,000,000, which help control sewage pollution in the city. Among processes included in these works are his "step aeration", a modification of the activated sludge process, and "high rate activated sludge" process. Mr. Gould's studies of final settling tanks for activated sludge have also led to radical changes in these units.

Noting these accomplishments in its citation, the board added that Mr. Gould has "dedicated himself continually to the task of removing sewage pollution from the waterways surrounding New York City by the building of intercepting sewers and modern treatment works. In carrying out this objective, he has blazed new trails by developing better ways to treat sewage in smaller plants and at less cost."

Mr. Gould's award is the second to be made by the ASCE section. The first was awarded last year to Emil H. Praeger of New York City for his design of Pier 57 in the Hudson River. The Metropolitan Section, with more than 3,000 members, includes greater New York, Westchester and Rockland Counties, and northern New Jersey.

O'Connor To Represent Michael Baker Companies

Leon Phillip O'Connor is the South American representative for both Michael Baker, Jr., Inc., consulting engineering firm of Rochester, Pa., and Mibaker, Inc., an affiliated Panamanian engineering and construction company. He will have headquarters in Rio de Janeiro.

The international representative is a former executive vice president and director of Thompson Starrett Co., Inc., New York, N. Y., general

contractor and builder. Recently serving as a consultant for construction companies, Mr. O'Connor was general manager of the airport development program of Pan American Airways during World War II.

Army Names Engineers For Division, District

Changes in division, assistant division, and district engineers, and the appointment of a Panama Canal maintenance officer, all to become effective sometime this summer, have been announced by Major General S. D. Sturgis, Jr., army chief of engineers.

The Alaska district engineer, Colonel Louis H. Foote, succeeds retiring Brigadier General Don G. Shingler as North Pacific Division Engineer. He will have headquar-



Col. Carl Y. Farrell, recently appointed Alaska District Engineer for the U. S. Army Corps of Engineers.

Photo courtesy Corps of Engineers

M-R-S tractors are your key to greater EARTHMOVING PROFITS!



Here the high drawbar pull of the M-R-S 190 teams up with a push tractor to secure a typically heavy payload in an 18.7 c.y. struck capacity LeTourneau W Scraper.

Read how M-R-S tractors can reduce your operating cost and increase your earthmoving production!

Whether your annual dirt volume is in the millions of yards or only a few thousand yards, M-R-S tractors are your key to greater production and lower operating costs.

FOR THE GRADING CONTRACTOR

For the grading contractor employing one or more fleets of high capacity units, M-R-S tractors reduce production costs by providing (1) higher hauling capacity per unit — less labor, fuel, etc., to charge to each yard of dirt moved; (2) greater usable speeds — for more cycles per hour — more dirt on the fill at the end of the day; (3) superior maneuverability — less time loss per cycle turning large units in narrow cuts and fills.

FOR OTHER CONTRACTORS

For the street contractor, building contractor and grading contractor with a low annual dirt volume to move, M-R-S tractors provide unequalled self-loading ability. This means each tractor and proper size scraper (see chart at right) is a self-contained grading team completely independent of pusher assistance. Such a unit is capable of moving quickly from job to job and economically moving relatively small quantities of dirt at widely scattered locations.

FOR ALL CONTRACTORS

Regardless of the volume of dirt you move per year, M-R-S tractors further reduce production costs by providing unequalled versatility and, in many instances, lower equipment investment.

These great cost-cutting features are illustrated by the photographs on these two pages. We urge you to study them and then write, wire, or phone for complete information about M-R-S TRACTORS, THE WORLD'S MOST MODERN LINE OF HEAVY DIESEL PRIME MOVERS.

CHECK HERE FOR THE PROPER M-R-S TRACTORS TO FIT YOUR OPERATION

	M-R-S 125 125 H.P.	M-R-S 150 200 H.P.	M-R-S 190 275 H.P.
Self-Load (Struck Capacity Scrapers)	8	10	12
Pusher-Load (Struck Capacity Scrapers)	13.5	16	20

ters in Portland, Oreg. Colonel Carl Y. Farrell, assistant engineer in Alaska, succeeds to Colonel Foote's post.

Effective next month, Colonel John L. Person and Colonel Hugh M. Arnold will become, respectively, Ohio River Division Engineer, Cincinnati, Ohio, and Director of Engineering and Construction Bureau, Panama Canal. Colonel Person, formerly commander of the Port of Leghorn, Italy, succeeds retiring Brigadier General Paschal N. Strong. Colonel Arnold, now attending the Army War College, succeeds Colonel Craig Smyser.

Colonel Andrew J. Goodpaster, Jr., now assigned to Supreme Headquarters Allied Powers Europe in Paris, will become San Francisco District Engineer. He replaces Colonel George H. Walker. In

August, Colonel Willard P. McCrone will become Galveston District Engineer, succeeding Colonel James D. Lang. Colonel McCrone is now assigned to the office of the Assistant Chief of Staff, G-4, in Washington, D. C.

The executive officer to General J. Lawton Collins in Washington, Colonel Robert F. Seedlock, will become Assistant Mediterranean Division Engineer in September. His headquarters will be in Nouasseur, French Morocco.

Houston Man to Head Texas Aggregates Assn.

Russell Thorstenberg, of Thorstenberg & Tamborello, Houston, Texas, was elected president of the Texas Aggregates Association at its annual meeting in Austin.

Serving with Mr. Thorstenberg for the year will be John H. Langston, vice president, and G. O. Rogers, secretary. Directors of the organization for 1954 are W. D. Bryson, John H. White, H. M. Lacy, C. A. Chipley, George G. Smith, and Houston Clinton.

N. Y. Building Congress Elects Dandrow President

C. George Dandrow, vice president of Johns-Manville, was re-elected president of the New York Building Congress at the 33rd annual meeting of the organization in New York's Hotel Astor.

Joining the Boston, Mass., sales office of Johns-Manville in 1922, Mr. Dandrow was later transferred to the general engineering staff of the company's New York headquarters.



C. George Dandrow, president of the New York Building Congress.

After serving as staff manager and sales manager, he was made a vice president of the organization in 1946.

Active in industry affairs, Mr. Dandrow is a member of the American Society of Civil Engineers, the Engineers' Club, and The Moles. An alumnus of the Massachusetts Institute of Technology, he holds offices in several organizations affiliated with the Institute.

Other officers elected to serve with Mr. Dandrow include Max Abramovitz, John J. Brennan, A. E. McKenzie, A. Walter Nelson, and H. C. Turner, Jr., vice presidents; Otto L. Nelson, treasurer; Vernon Jarboe, secretary; and Charles A. Selby, chairman of the finance committee.

McGraw Names F. J. Mayo Executive Vice President

The board of directors of F. H. McGraw & Co., Hartford, Conn., has elected Frederick J. Mayo executive vice president of the engineering and construction firm.

Mr. Mayo, an officer of the company since 1946, has been serving



Frederick J. Mayo, recently elected executive vice president of F. H. McGraw & Co.

as vice president and general manager in charge of the company's billion-dollar construction project for the Atomic Energy Commission at Paducah, Ky., since 1951. He will assume his new duties as soon as construction of the atomic plant enters its final stages.

During World War II, Mr. Mayo served McGraw as a construction engineer on the Bermuda Naval Air Station, and later, he spent two years as chief executive of a McGraw subsidiary in South America. Until he was transferred to Paducah, he was in charge of the company's foreign operations. He is a member of the Professional Engineers Society and the Association of Iron and Steel Engineers.



UNEQUALLED SELF-LOADING ABILITY. This M-R-S 190 is shown self-loading an Isaacson 12 c.y. struck capacity scraper. This outstanding self-loading ability is made possible by the exclusive patented M-R-S weight transfer device which enables a more efficient utilization of engine horsepower and results in up to 37% more tractive ability.



SHORTER NON-STOP TURNS. Because of the extra light weight of the tractor's front axle, the low draft between the tractor and scraper and the tractor's positive turning brakes, M-R-S tractors are capable of turning up to 135 degrees in relation to the scraper. Practical non-stop 180 degree turns may be made with scrapers up to 20 c.y. struck capacity in 28 to 34 feet.



EXCLUSIVE VERSATILITY. Since M-R-S tractors are not permanently attached to the scraper they can be quickly unhooked in a matter of minutes and easily reattached for powering heavy rubber-tired compactors like the 50 ton unit shown above, large sheepfoot rollers, construction rippers and other useful tools.



EXPEDITES TRANSPORTATION. When used with heavy machinery trailers, M-R-S tractors provide an economical means for moving heavy equipment from job to job. Axle loads are reduced since none of the trailing weight is carried by the tractor. Axle loads may be further reduced by equipping the trailer with tandem axles front and rear as shown above.



USE THE SCRAPERS YOU ALREADY OWN. If you already own one or more large four wheel scrapers, by purchasing M-R-S tractors to power them, you will sustain a considerable saving over the purchase of hauling units where the tractor is integral with the scraper. The M-R-S 150 and 16 cubic yard scraper shown above is just one example of M-R-S tractors teamed up with large four wheel scrapers for greater production at lower cost.

Investigate before you invest!



Write, wire, or phone for complete information!

MANUFACTURING COMPANY

POST OFFICE BOX 1206, JACKSON, MISSISSIPPI, U.S.A.



Blasted rock in the penstock section of the Indian Pond Dam project is excavated by a Koehring 11½-yard shovel and loaded into a Koehring Dumptor. The boulders are used in the dike. C&E Staff Photos

New Hydroelectric Dam

Concrete placing is done by 10-ton cableway for Indian Pond project on the Kennebec River

By ALBERT C. SMITH, Field Editor

THE HEADWATERS of the Kennebec River, that once churned unchecked through the steep rock gorges of central Maine, are slowly being contained behind a rising wall of concrete. Indian Pond Dam is nearing completion in the middle of this timberland wilderness, creating a 5½-square-mile lake which will supply water to spin three big turbines. Until the penstocks are opened, the river must be directed over the rising dam.

The Indian Pond Project is the first step in the Upper Kennebec Development, a program of the Central Maine Power & Light Co. The concrete and earth dam is located about 90 miles north of Augusta, above the confluence of the Dead and Upper Kennebec Rivers.

Ellis C. Snodgrass, Inc., Portland, Maine, is the principal contractor, and Herbert E. Sargent, Inc., Stillwater, Maine, is the associate contractor. Sargent is handling earth-

Concrete is mixed in the two Koehring 4-yard tilting-type mixers in the Johnson batch plant. To the left is the head tower of the 900-foot Sauermaut faultline cableway, which handles forms and equipment as well as pours.

The 65-foot-high tail tower of the cableway runs on a 300-foot-long track on the right bank of the river, and is powered by a GM diesel engine housed in the base of the tower. The cableway has a 10-ton capacity.





Raw excavated material is fed into this Austin-Western 25 x 40-inch jaw crusher through the hopper at the top. The crushed aggregate is then moved by belt conveyor to a Pioneer vibrating screen.



The 250-foot inclined Hewitt-Robins conveyor carries the washed and screened aggregate to the top of the Johnson automatic batch plant. A rail-mounted hopper transfers the mixed concrete to a bucket which rides the Sauerman cableway to the pour.

amTo Spur Power Program

work and aggregate production, while Snodgrass is doing the batching, mixing, and placing. The \$17,000,000 job started in April, 1952, and is expected to be completed by the end of this year.

The dam consists of a main concrete structure across the gorge of the present channel, an intake on top of the left bank, and an earth and rock-fill dike which extends about 800 feet from the intake to high ground. The new water sur-

face will cover an area of about 5½ square miles but, because of the remote location, there are no highways or railroads here which need to be replaced.

Main Structure

The main dam structure is about 270 feet long and about 175 feet high to the top of the bridge. A stilling basin 108 feet wide will have a bumper capable of maintaining a 14-foot-deep body of water inside.

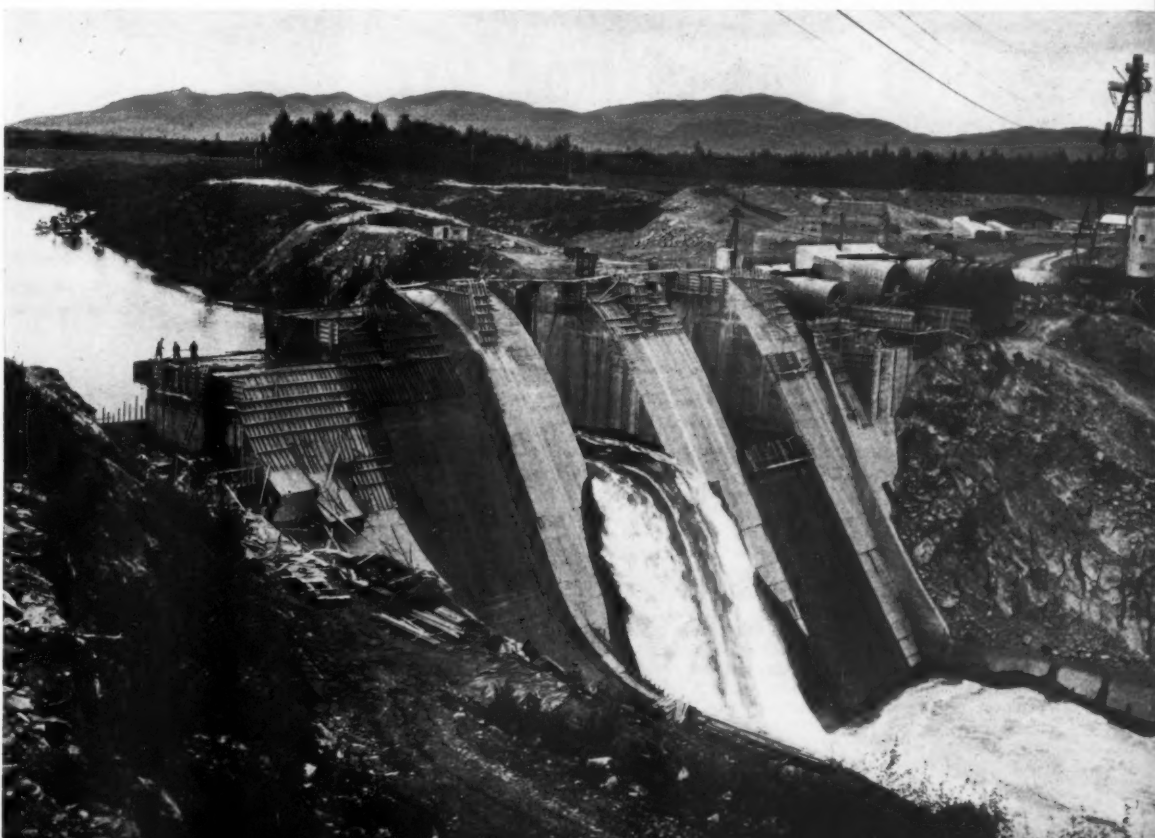
The spillway will have three car-wheel-type vertical-lift crest gates and four stanchion sections. All gates and stanchions are 30 feet wide and 15 feet high. On the right bank, a log sluice will be installed, with a chute extending downstream to the tailrace.

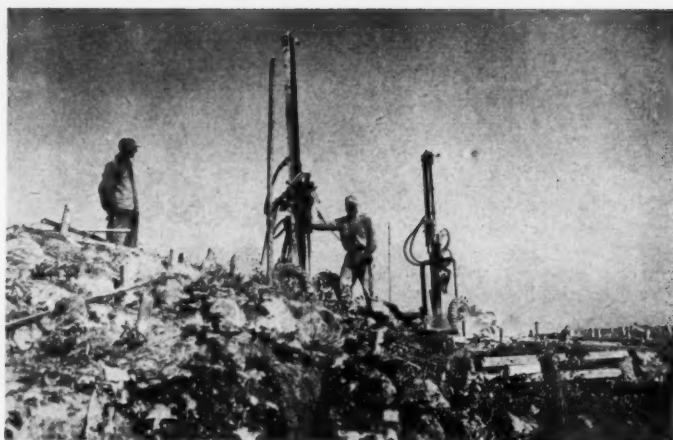
The dam is so designed that in the event of extreme flood, the pond will automatically rise about 5 feet, affording a flood storage capacity of one billion cubic feet. Provision is

also made for a drawdown of 3 to 5 feet if the pond has to be used for a small amount of storage.

The 45-foot-high concrete intake has openings for four penstocks. The three larger ones are fitted with car-wheel-type vertical-lift gates having electrically operated hoists. Guides will accommodate either the removable trash racks or stop logs which will close off the openings. Stop logs slots for the two 24-foot-diameter penstocks, the three crest

Water is diverted through one monolith in the main dam structure while the other is built up. After four 5-foot lifts are completed on one side, precast concrete stop logs are dropped into slots in the upstream face to close the other monolith.





Worthington wagon drills are used to drill holes in a high rock knoll preparatory to blasting. All such knolls were removed in leveling the flood area around the dike.

C&E Staff Photo

gates, and the four stanchion sections will have similar dimensions to make them interchangeable. A full housing will be provided around all the larger intake gates; outdoor-type hoists will be mounted on top.

Steel penstocks 325 feet long will be carried from behind the intake and across the hill to the powerhouse. The upper and lower ends will be embedded in concrete for anchorage. The ultimate installation will have four penstocks. Two will have 6-foot and 17-foot diameters, and two, 24-foot diameters.

Powerhouse

The powerhouse, located in a ravine on the left bank, is set back out of the main channel. It is turned at an angle with the dam, so that the discharge from the draft tubes is directed straight down the present river channel.

ected straight down the present river channel.

The concrete powerhouse, founded on ledge, will be 70 x 210 feet. The superstructure will be of brick and steel and equipped with a traveling crane with two 100-ton hooks. The initial installation will consist of two 30,000-kw and one 15,000-kw vertical units, each with a Baldwin Francis turbine connected to G-E generators. A small S. Morgan Smith vertical turbine, direct connected to a 1,500-kw G-E generator, will also be installed for station service.

The total concrete in the dam, intake, and powerhouse will amount to some 125,000 to 130,000 yards. Generation will be at 13.8 kv. This will be stepped up in a substation adjacent to the east end of the powerhouse. Then it will be transmitted over a new 90-mile 115-kv line to connect with the system grid at Winslow substation.

Before any major equipment could be brought to the site, it was necessary to construct several miles of access roads. Through an agreement with local timberland owners, the use of an abandoned railroad right-of-way was granted. This provided a satisfactory stretch of road-building terrain from the nearest public road to the dam site.

Sargent moved shovels, trucks, and dozers into the area and built an 8½-mile road of gravel base and tar surface. Another 4 miles of road was required to haul sections of the cableway tail tower upstream to an abandoned trestle and then downstream on the other side. A considerable amount of preliminary grading was also required to prepare an area for the contractor's yard on the top of the left ridge.

Stream Diversion

Instead of following a diversion tunnel method, the engineers of Central Maine decided to excavate a notch in the rock on the right side of the gorge and move the river through it while the main dam was being built. In addition, a concrete wall was constructed at the ends of the notch to help keep the rushing waters away from the site. When the notch and wall were completed, timber cribs were built out from both ends to divert the flow.

Shovels moved into the dam area to clean off all undesirable material. High-pressure jets of water were used for final cleaning.

Following this, concrete was placed along the axis of the dam until the monoliths began to rise at or above the river level. The plan was to leave two alternate monoliths down, diverting the river from side to side as alternate monoliths were raised. To do this, slots were built into the sides of the adjacent monoliths at their upstream faces. Precast-concrete stop logs, 36 feet long and weighing 10 tons, were lowered into the slots to block one monolith and divert the water through the other.

When the monoliths had reached the proper height, the cofferdam was opened and the river flowed over the lowest monolith. The cofferdam was then moved across the original diversion notch so that concrete could be placed across to the right wall of the gorge.

The stop-log system was used for all the succeeding pours on the two



3 Dozers Stockpile 5,000 Tons of Iron Ore Daily at Erie, Pa.

Three Gar Wood dozers, on Allis-Chalmers HD-20 tractors with Gar Wood control units, are used to stockpile an average of 5,000 tons of iron ore every day during the summer in order to build a reserve. Over 650,000 tons are stockpiled for use by the steel industry during the winter when the lakes are closed to shipping.

Over 200 railroad cars are kept moving from docks to stockpile in a continuous operation to build up the necessary supply of ore.

When full railroad cars arrive they are emptied by two clam shell buckets that go down into the cars to load and dump as far as they can reach. The dozers then spread and pile the ore.

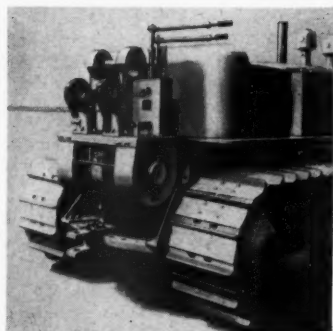
As it is impossible to completely clean the cars with the bucket, they are then moved to another station where an automatic shaking device completes the operation. The ore emptied in this way is moved by a conveyor to another pile where the dozer takes over the spreading.

Movement of this extremely heavy material on a rigid, continuous cycle has

been a real test of the ability of the equipment to operate smoothly and efficiently without mechanical difficulties or delays.

GAR WOOD CABLE CONTROL UNIT USED

Rear-mounted, double-drum Gar Wood cable control units are used on two of the HD-20's while the third machine is equipped with a Gar Wood hydraulically controlled dozer. The double-drum units are available in the model 261, medium-duty (shown at right) and the model 281, heavy-duty. With these units, tractors can also be used for scraper operations. A front-mounted, single-drum, model 151, is also provided for dozer operation.



GAR WOOD CABLE CONTROL UNIT

GAR WOOD INDUSTRIES, INC.

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monoliths. Generally, 15 or 20 feet of stop logs was set at one time to permit the placing of two or three 5-foot lifts in one monolith before work was shifted to the other. The river, of course, rose with the dam, producing a temporary waterfall.

Aggregate Production

All the aggregates for Indian Pond Dam, excepting fine sand, are being acquired from a wide area of the Kennebec River about 20 miles downstream from the site. The gravel bed is at least 30 feet deep, which means that excavators have to do little moving. Trucks have a short 500-foot haul to the processing plant.

The operation starts as a Lorain 80D crane loads its dragline bucket from the hole and side-casts the wet material on a long stockpile where it can drain. A Lorain shovel, working a dry section of the pile, keeps three dump trucks hauling to the plant. The trucks back up a rock-filled timber ramp and dump into a hopper. A plate feeder on the hopper moves the riverbed material to an Austin-Western 25 x 40-inch jaw crusher powered by a Caterpillar D13000 diesel engine.

The crushed material is then carried up a 30-inch belt conveyor to a Pioneer 3-deck 5 x 14-foot vibrating screen. As the aggregate moves down the screen, it is also washed by jets of water from cross pipes. The high-pressure water is supplied by two Gorman-Rupp gasoline-powered pumps. A Murphy 12 diesel powers a 75-kw generator which supplies power to the plant.

Four kinds of aggregate, together with coarse sand, are separated by the screens and stored in the proper bins. A fleet of trucks hauls to the dam. Production averages about 1,000 cubic yards per 11-hour day.

Aggregate Handling

At the dam, trucks dump the aggregate on the proper stockpile. The six stockpiles are lined up parallel to the river over a 200-foot-long timber-lined reclaiming tunnel. A horizontal belt conveyor carries aggregates to the end of the tunnel, where they are transferred by hopper to a 250-foot inclined conveyor leading to the top of the Johnson automatic batch plant. The 30-inch-wide belt is supplied by Hewitt-Robins.

The swivel-chute operator on the top of the plant signals men in the tunnel with a system of lights and bells when he requires a certain size aggregate. Six bins are set into the plant for holding coarse and fine sand, and 1/4 to 3/4, 3/4 to 2, 2 to 3, and 3 to 6-inch stone.

Dragon cement is brought by rail to a siding in Bingham, Maine, about 40 miles south of the dam site. It is moved in bulk by a screw conveyor to a hopper, then raised to the top of a Johnson 800-barrel storage silo by a bucket elevator. Covered dump trucks load from the silo and haul to the batch plant, where the cement is elevated into either a 300-barrel bin in the plant or the 5,000-barrel storage silo.

Batches are measured out automatically and then dropped into one of two Koehring 2-yard tilting-type mixers on a platform below. Water for the mix, and for fire and sanitary purposes, is gravity-fed from

a 15,000-gallon water tank on the hill. The tank is kept full by three Worthington 2-inch electric pumps.

Cableway

One of the more interesting features of the job is the use of a Sauerman tautline cableway to place concrete and handle everything else that has to be carried to and from the concrete structure area.

Because of the mountainous terrain, the 10-ton-capacity cableway is ideally suited to the job. It consists of a fixed head tower 125 feet high, and a movable tail tower 65 feet high. The tail tower rides on 300-foot lengths of track placed along the top of the right side of the gorge. It moves back and forth under the power of a GM diesel engine housed inside the tower.

(Concluded on next page)



An American guy derrick, extreme left, places concrete in the powerhouse which is under construction below the dam. The derrick is mounted on a concrete pedestal and handles buckets hauled to the site on dump trucks.

C&E Staff Photo

How to Judge Value in a Shovel-Crane

You can't compare the quality of two pieces of equipment by simply comparing their so-called "features." For instance, one shovel-crane manufacturer may "sell" the idea that he has a 25 ft. hoe boom as compared with a competitor's 23 ft. boom, leaving the inference that it would dig deeper. Actually, the stick used with the 23 ft. boom might be longer than the one on the 25 ft. boom and, therefore, would dig as deep or deeper. One manufacturer might "feature" antifriction bearings as proof that his machine excelled while actually the high speeds at which he runs his shafts might mean that he couldn't use anything else.

Sometimes highly touted "features" are ballyhoo to cover up inherent weaknesses elsewhere. After all, being different isn't necessarily better.

Design features cannot just be imposed on a machine—they must be integrated into all parts and functions. Design features as such are not what users really buy. They buy only what the features will do for them in the way of low end cost, ease of use and, primarily, the profits they will produce.

Instead of features, we at Thew believe in what we call "Balanced Quality." We don't claim to "out-feature" every one else; to be faster, more powerful, to have more of "everything." But we do offer "Balanced Quality" in which all the components, and functions, are quality-engineered into a completely integrated unit.

In many respects, we do better than others... in others, we come close to the top. But all-in-all, the combination results in a machine in which quality has been distributed evenly throughout the machine rather than concentrated in a few sales features. A machine in which power has been "balanced" properly between all operations, in which the speeds of various functions have been balanced for integrated, synchronized operations, in which the controls have been balanced to produce quick starts and rapid acceleration, in which the weight of the machine has been balanced for maximum stability.

Any one of these results in itself, or the design by which it is achieved, may not be sensational but, added all together, they will do that one thing we believe you really want more than anything else—and that is: put more dirt in the wagons, faster, at lower cost—and to do it longer!

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(Continued from preceding page)

The stationary head tower is set up adjacent to the batch plant on the left bank. The span between towers is 900 feet. A carriage, containing the hoisting sheaves, travels on a heavy 2 1/4-inch track cable. It moves by an endless line which connects to one side of the carriage, runs to the head tower, down, several times around one of the drums, back up to the head tower, across the span to the tail tower, and then back to the other side of the carriage.

The load line runs from the carriage through the head tower and down to another drum. The Clyde 2-drum hoist is powered by a Buda 300-hp diesel engine driving through an American fluid coupling.

To keep the cables separated as the carriage moves back and forth,

hanging carriers are released from the carriage at 200-foot intervals. A separate line has buttons which pull the carriers from a horn on the carriage. When the carriage moves back to the head tower, the carriers are picked up.

The cableway is used during the day for handling forms and equipment; and on the night shift, it places concrete.

Concrete Placing

Because the head tower is set up adjacent to the batching and mixing plant, the Johnson 4-yard buckets are easily loaded. A car-mounted bucket is loaded under the batch plant hopper, winched out about 30 feet on a ramp, then dumped into the 4-yard bucket. A 2-drum hoist, powered by a Le Roi 60-hp engine, pulls the car from under the hopper.

When the 4-yard bucket is loaded, it is carried out to the dam and dumped in the proper area. Telephone communication between the two towers and the pouring site makes it possible to spot the bucket accurately.

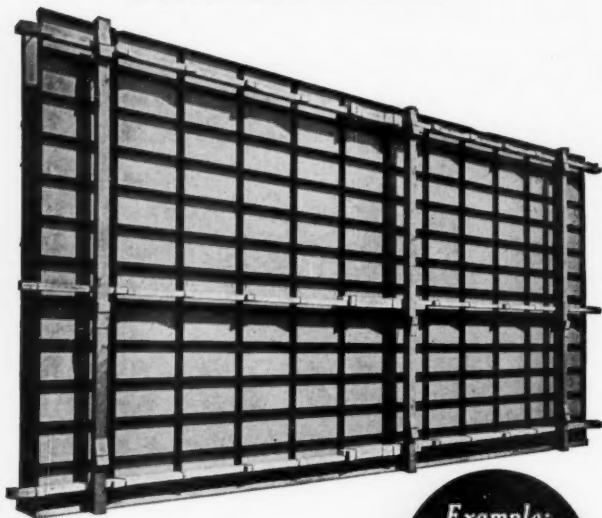
Aside from this, concrete-placing methods are conventional. The buckets dump pneumatically into forms made of Blaw-Knox cantilever panels. Concrete is placed in stairsteps from the outer edges and consolidated with Viber vibrators. A 6-bag mix of concrete, air-entrained with Darex, is used on the faces, and a 4-bag mix is used inside. Water curing is continued for 7 days. Production averages about 800 cubic yards per 10-hour day.

Concrete for the powerhouse is being placed by bucket and Pumpcrete. Buckets are loaded at the

mixing plant, hauled to the powerhouse in dump trucks, and handled by Manitowoc cranes or the American guy derrick. Set up on a concrete pedestal, the derrick has a 75-foot mast and a 60-foot boom. It is operated by a 2-drum hoist powered by a Waukesha engine.

Keeping all parts of the job operating during the rugged Maine winter presented some special problems. Concrete lifts in the main dam structure, for instance, had to be placed under a canopy of wood trusses and tarpaulins. The 36-foot-long trusses were spaced 20 feet on center above the pour, connected by timber beams, and covered with tarpaulins. Space heaters, supplied with steam from a Cleaver-Brooks 40-hp boiler, were hung from the bottom chord of the trusses. Tarpaulin sections were removed only

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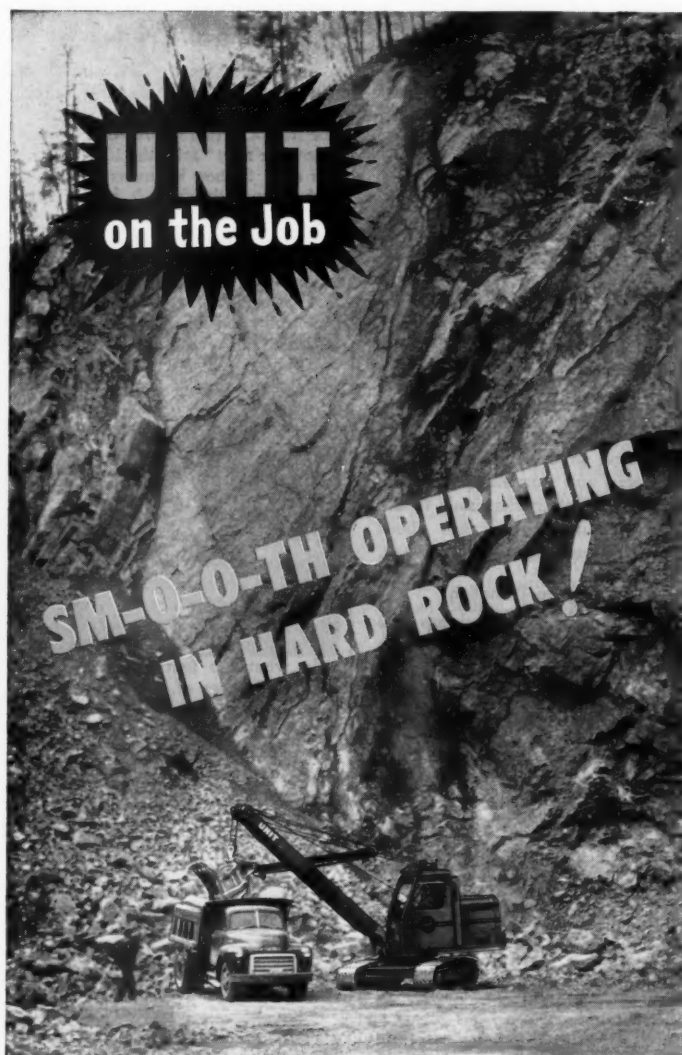
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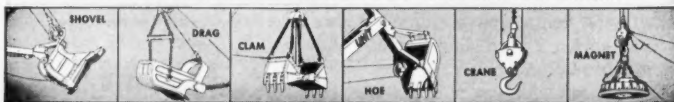


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CONTRACTORS AND ENGINEERS

to allow buckets to pass through the canopy in making a pour.

Steam heat was also needed to keep the stockpiles workable. Along the roof of the reclaiming tunnel, three 1¼-inch steam lines were installed and perforated with ½-inch holes every 2 feet. On top of the piles, workmen used 5 pipe lances. Steam lines were also sent to the mixers and various space heaters, and they were even run along the water lines. Steam was supplied by a Cleaver-Brooks 125-hp boiler.

Electric power for the entire job is being produced by three 125-kw generators powered by Murphy diesels.

Earthwork

Sargent's earthwork consists primarily of building a 1,500-foot-long earth and rock-fill dike from the left

side of the dam to high ground. Two smaller fills are required to close off ravines.

The dike extends to bedrock and is made of an impervious clay core, covered on both sides with coarse rock on a 2.5 to 1 slope. Overburden was first excavated along the axis of the dike with shovels. Workmen were then sent in to hand-clean and wash all material from the bedrock. In the ravines, concrete cutoff walls were constructed to prevent seepage.

When the rock foundation was prepared, Sargent moved Lima ¾ and 1½-yard shovels into a clay pit about one mile upstream and started a fleet of trucks hauling to the dike. At the same time, a Koehring 1½-yard shovel excavated blasted rock from the penstock areas and loaded three Dumpsters. The dike was built up as trucks dumped clay in

the center and the Dumpsters placed coarse rock on the edges. Dozers leveled the dumps and sheepsfoot rollers made the required compaction.

Rock blasting is also required in the flood area to remove high knolls. Worthington wagon drills, Timken bits, and American Cyanamid explosives do the job. Air is supplied by a Joy compressor.

Personnel

Ellis Snodgrass is principal contractor and project manager. Dave Williams is superintendent for Snodgrass, and Mike Greaves is superintendent for Herbert Sargent, associate contractor. Tom Dempsey is master mechanic.

Ford Harris is chief engineer of the Central Maine Power & Light Co. John Downey is resident engi-

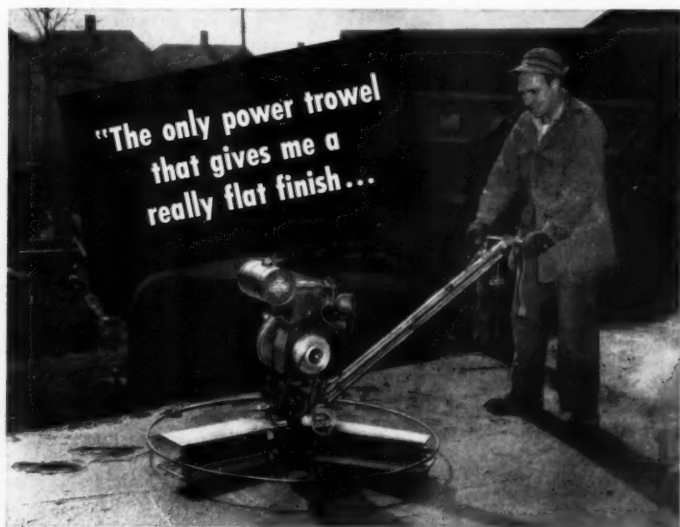
neer. Charles T. Main, Inc., Boston, Mass., is consulting engineer.

THE END

A-C Slidefilms Available

The second group in a series of educational 35mm sound slidefilms for industry is available through Allis-Chalmers general machinery division district offices. The three slidefilms, all on V-belt drives, are "In Every V-Belt Drive", "For Better Driving", and "Selecting a Drive".

The first, in color, covers the engineering principles that are basic in every V-belt drive application. The second is concerned with the installation and maintenance of multiple V-belt drives. The third tells how to check characteristics to find the best type of drive and how to engineer it to do the job.



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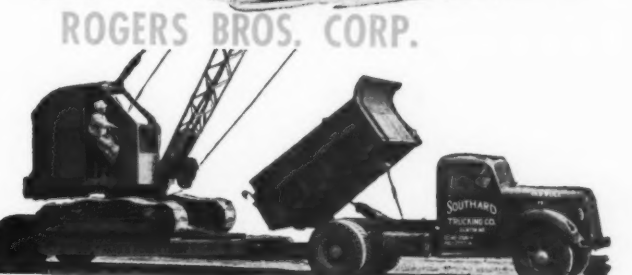
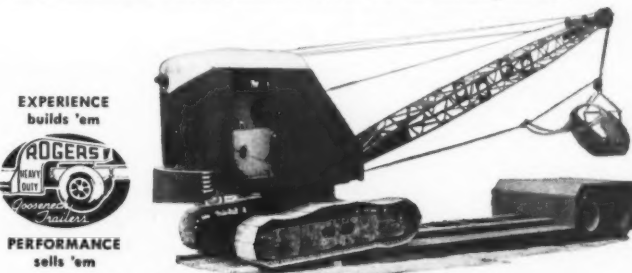
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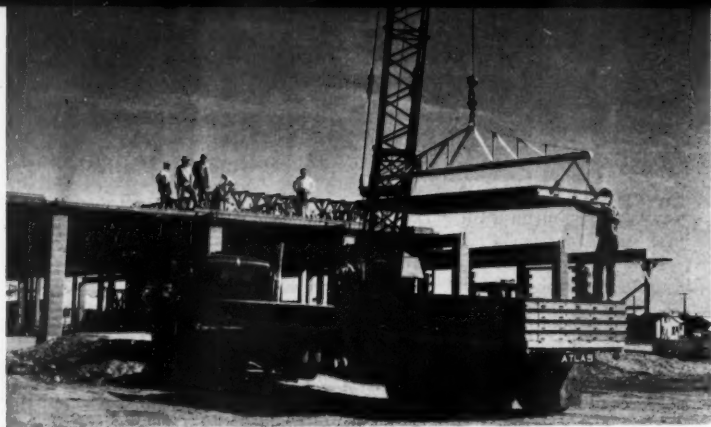
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Attaching loaded tilt deck trailer



Prestressed Panels Used in Concrete Roofing Job

A prestressed panel of lightweight concrete blocks is lifted from a flat-bed truck for placing on the roof. A crane places the panels, which are assembled at a manufacturing plant in nearby El Paso, Texas.

U. S. Air Force Photo

**196 pay yds.
hourly
on 700' haul**

**Performance of 2
7-yd. Tournapulls
in gumbo speeds
county job in Iowa**

Unit output of 98 pay yds. per hour, 11 hours a day, helped finish this 47,700-yd. job in 3 weeks. "Besides its many road assignments," says Owner Henry Brueck, "the D Roadster is good for building driveways, watersheds, and for small clean-up work."



Brueck Construction Co., Battle Creek, Iowa, had 47,700 yards of wet sandy loam and clay gumbo to move on 2½ miles of Pottawattamie County Road 727, north of Minden. With 2 rubber-tired, 28 mph D Tournapulls in the Brueck equipment fleet, short as well as long-haul dirtmoving was put on a fast cycle basis. Here are typical performance figures:

Working with pusher in borrow pit, each sideboarded "D" heaped 6½ pay yds. of sticky gumbo in 0.7 minutes. Haul, dump, and return on muddy 1400 cycles took only 2.8 minutes. Making a round trip every 3.5 minutes, each "D" delivered 15 loads per 55-minute hour. Combined output for the 2 Tournapulls: 196 pay yds. hourly.

"D's" work where crawlers can't

"I like the way Tournapulls work in tough places," reports Foreman Tony Petersen. "They go places where crawler-scrapers won't go."

In addition to production work like this, "D's" often work alone on small-yardage, self-loading utility

jobs. When one job is finished, Tournapulls drive off under their own power to the next.

To reach Minden, for example, the Tournapulls traveled over main highways from Ida Grove . . . made the 85 miles through traffic in 4 hours. There was, of course, no delay for moving in of trailer equipment, loading, or unloading.

Cut maintenance time in half

Tournapulls also save maintenance time and money. "We can service two or three D Roadsters in the same time it takes to do one crawler and scraper," says Mechanic Wayne Meier.

Veteran contractors like Brueck and his men *know* Tournapull's go-anywhere mobility means fewer hours lost for weather and travel . . . longer work seasons . . . lowest net-cost-per-yard under all conditions. For further proof that Tournapulls will pay off for you, write us for production records on jobs like yours. Study these owner-verified figures . . . then, if they look interesting, have us demonstrate a Tournapull on your present job.



Tournapull—Trademark Reg. U.S. Pat. Off. DP-489-H-b

At Biggs Air Force Base, on the outskirts of El Paso, Texas, a subcontractor working for R. E. McKee, General Contractor, Inc., has solved a long-standing roof problem for the U. S. Army Corps of Engineers. The new Armament and Electronics Building, a key structure in the development of the air base, has been roofed according to a prestressed principle, using Strescrete blocks manufactured by Atlas Building Products Co. of El Paso.

The work was done by Atlas under a subcontract arrangement.

Despite the fact that the building is 168 x 145 feet, the roof was put on in only three weeks. No shores or underpinning were required, and spans up to 16 feet between supporting columns were covered. The work proceeded rapidly and without trouble.

Construction of roofs for buildings of this design has always been a problem. If conventional poured concrete is used, it must be supported from below. If lightweight concrete is used, it also must be supported, and there are refinements in connection with using the required aggregates. Atlas Strescrete blocks, on the other hand, are manufactured to close tolerance, and the faces machined so that they can be strung together with a snug fit on steel rods. They are made from volcanic cinders and portland cement in 4, 6, 8, and 12-inch sizes.

By stringing the concrete blocks together on the rods, and then tightening the nut to a predetermined torque, the prestressing principle is used to develop lightweight concrete panels. For this job, 6-inch blocks were strung together with ½ and ½-inch steel rods. The panels were assembled at the Atlas manufacturing plant in El Paso.

Although the use of Strescrete roof slabs was new so far as the Corps of Engineers was concerned, the method had already solved another problem at Biggs AFB. When a big reservoir tank had to be re-roofed in a hurry and the time available for drying out the tank was limited, the Strescrete method proved the answer. The method has also been used for roof construction on the television transmitter station of station KROD-TV atop Mt. Franklin near El Paso, and in many smaller buildings on spans as wide as 30 feet.

Modern System

Strescrete is one of the modern labor-saving systems for the construction of lightweight reinforced-concrete floors and roofs. It is a precast method, backed by 12 years of

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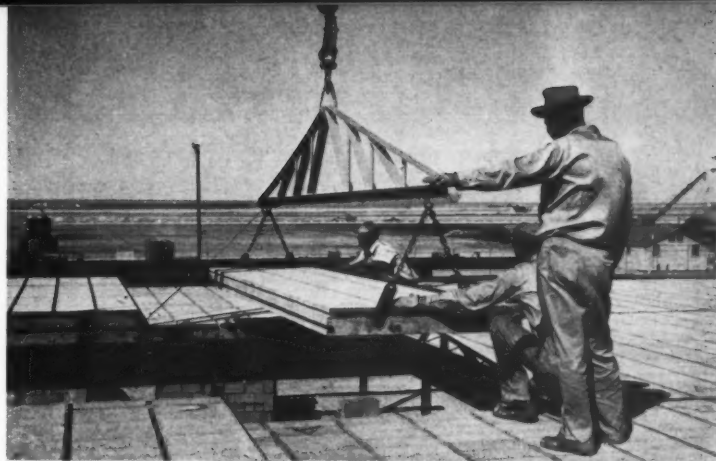
LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

Factory-assembled precast sections eliminate need for shores, underpinning on AFB building project

Here a panel is positioned on the roof by crewmen on the Biggs Air Force Base building project. After it is placed, the panel will be secured by cement grout. Steel reinforcing rods hold the 6-inch concrete blocks together.

U. S. Air Force Photo



exhaustive studies and analyses. The final design has been thoroughly tested and provides savings in both time and expense, as well as outstanding durability.

According to Atlas officials, Basalt Rock Co. of Napa, Calif. holds the basic patents on the process.

The slabs of lightweight concrete and prestressed steel are assembled into panels and delivered to the job site ready for installation on all routine work. Individual units are machine-made, thoroughly cured, and assembled at the factory to specified length and depth, thus providing the required area of steel to carry the load from support to support without vertical shoring. During slab assembly, steel is pretensioned to approximately the stress required in the designed loading of the floor or roof section. Consequently, Strescrete panels have a minimum of deflection under full load conditions.

Cement grout is poured between the slabs and the narrow joint section to cover the steel rods and to key the slabs together. A concrete topping may also be poured if required for additional strength or wearing surface. In the case of this air-base building, a built-up roof of asphalt and pitch was constructed over the lightweight units.

Each panel is an assembly of fully cured blocks, with precision-ground contacting surfaces. Continuous steel washers are positioned at the end of each assembly, and threaded reinforcing rods are placed inside splines molded in the segments and laced through the end washers. Tension not exceeding the allowable working stress of the reinforcement is applied by hydraulic jack or torque wrench. This induces a thrust applied eccentrically to the axis of the section, and moments are opposite in sign to those imposed by all subsequent loading.

Applied loads, within design limits, will not substantially increase the stress in steel or concrete, but will approximately reverse themselves with design compression value in top fibers and near-zero compression in the bottom fibers of the panel.

Work Moves Rapidly

At the time the construction schedule called for placing the roof, it was necessary that the work move speedily. The lightweight panels were therefore made up from special assembly tables at the manufacturing plant, loaded by a traveling hoist to waiting trucks, and hurried out to the job. On average days, the assembly shop can turn out from 1,000 to 1,500 square feet of completed roof

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FULL VISION means you'll Move More with a **MICHIGAN**

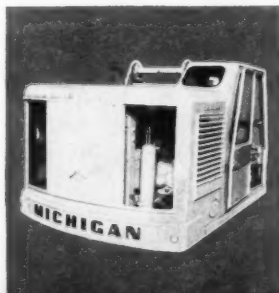
Step into a MICHIGAN* cab, and sit in the operator's comfortable seat. Notice how easy it is to follow every move on the job. 3604 square inches of glass!—see what excellent vision is provided, in all directions and overhead.

Here, indeed, is a masterpiece of smart modern design: a truly functional cab—fully ventilated, quiet; a comfortable cab designed to make the operator's job as easy as possible. Look, also, at the outside of the cab; at the adjustable louvers

on both sides for good ventilation; the sliding rear doors that make it easy to get at the engine; the rear window to complete the full-vision facility.

For an easy point-for-point comparison of the MICHIGAN with other machines, send for the MICHIGAN Fact Folio: contains full information, including an interesting book "More Yardage Through Air Power." The coupon gets prompt action.

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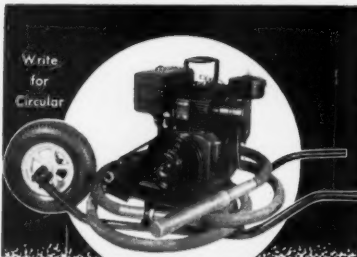
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panels, fully prestressed and assembled.

The trucks hauled these panels out to the job, where one of McKee's Northwest cranes waited to make the lift. The panels were positioned and secured, and the spaces were then grouted by McKee's forces. A roofing

crew followed, applying the built-up roof sections.

With the exception of two small two-story structures for the boiler room and special instruments, the building is of one-story construction. The roof is properly sloped for good drainage, and runoff water is disposed of in the general drainage system of the base.



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Roeth Vibrator units have a reputation for long, trouble-free service.

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Fred Schuller, superintendent of the Atlas Strescrete Division. Ray Day Photo

Use of the labor-saving scheme has impressed visiting inspectors, saved money in the initial construction cost of the building, and spared the contractor a number of problems by eliminating the need for supporting shores.

Personnel

M. W. Stovall and Fred Schuller handled field operations for Atlas Building Products Co. All field inspection and engineering supervision was under James A. Loughridge, area engineer, and Leonard J. Yelinc, project engineer, both of the Corps of Engineers. THE END

H. W. Richardson Dies

A well-known writer and editor in the field of heavy construction, Harold W. Richardson, died May 12 at his home in New Providence, N. J., after suffering a heart attack. He was 53 years of age.

Mr. Richardson had been editor of *Construction Methods & Equipment* since 1949. Previously he had been executive editor of the publication and construction and western editor of *The Engineering News-Record*.

During his career as a trade journal writer and editor, Mr. Richardson wrote about hundreds of heavy construction and engineering projects throughout the United States and Canada. He was a technical war correspondent during World War II.

One of the first observers to visit the atom-bombed city of Nagasaki, he wrote the first report of structural damage caused by the bomb.

He was the author of two books, "Practical Tunnel Driving" and "Bulldozers Come First". He was a member of the American Society of Civil Engineers, American Road Builders Association, Society of American Military Engineers, the Chicago Engineers Club, and the Moles.

Mr. Richardson was born in Sioux City, Iowa, and received his degree in civil engineering from the University of Colorado. For five years after his graduation from college, he was a construction engineer and superintendent with Bates & Rogers Construction Corp., Chicago.

Manual on Lifting Jacks

A comprehensive manual on lifting jacks is available from the Duff-Norton Mfg. Co., P. O. Box 1889, Pittsburgh 30, Pa. The illustrated manual explains how to choose the right jack for a job. It lists the available types of ratchet, screw, and hydraulic jacks in models with from 3 to 100-ton capacities, and gives complete specifications for each jack.

In addition to giving helpful hints on how to eliminate waste resulting from using the wrong jacks, the booklet explains in detail how to use, care for, and maintain jacks. The manufacturer reports that the manual will be used by the National Safety Council as an integral part of its store of safety literature on the proper use of jacks.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 650.



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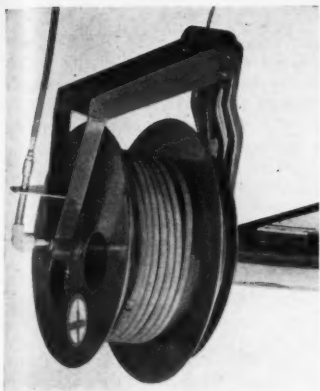
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Hose Reel and Tagline In Combination Unit

■ A combination hose reel and tagline was introduced recently by the McCaffrey-Ruddock Tagline Corp., 2131 E. 25th St., Los Angeles 11, Calif. This new heavy-duty unit eliminates the necessity of having a man stand by on the ground to re-charge the storage tank which actuates the air or hydraulically operated cylinder on the bucket. The Rud-O-Matic device also is said to provide safety while speeding crane operations.

The combination hose reel and tagline steadies the concrete bucket at any angle of the boom while paying the air hose in and out. The air hose is never under stress because the steel tagline absorbs the tension through a positive coil spring action at all times. The bucket is steadied during the entire lift, and twisting and swinging are minimized. The new combination tagline comes fully equipped with all necessary fittings and may be easily installed in 30 minutes.

For further information write to the company, or use the Request Card at page 18. Circle No. 532.

Truck and Mixer Unit For Ready-Mix Service

■ A single-passenger cab-beside-engine truck for hauling ready-mix concrete is shown in literature from the Cook Bros. Equipment Co., 3334 San Fernando Road, Los Angeles 65, Calif. This company is the exclusive national distributor for Challenge truck mixers, and it manufactures the Model M-310 truck covered in this folder.

The brochure includes a weight breakdown for front and rear axles and detailed information on the Eas-E-Drive front-end design of the truck.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 590.



"Would you be so kind as to await my signal hereafter?"

Bridge-End Marker Is Visible at Night

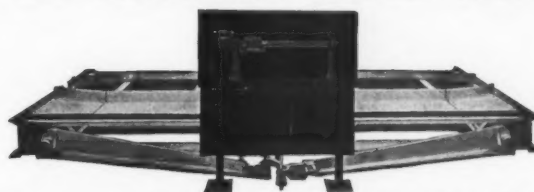
■ A red-and-silver marker for bridges and culvert abutments that is reflectorized for night visibility, is being marketed by the Minnesota Mining & Manufacturing Co., 900 Fauquier St., St. Paul 6, Minn. The marker is made of a .081-gage aluminum alloy and is faced with a Scotchlite brand reflective sheeting. It is said to reflect brightly at night up to a half mile away, even through heavy rain and regardless of the angle of approach.

The diagonally striped marker measures 8x36 inches and is attached directly to the bridge or other structure. Because of the non-corrosive character of aluminum and the self-cleaning ability of the smooth-surface reflective sheeting,

the marker needs practically no maintenance, according to the company.

For further information write to the company, or use the Request Card at page 18. Circle No. 569.

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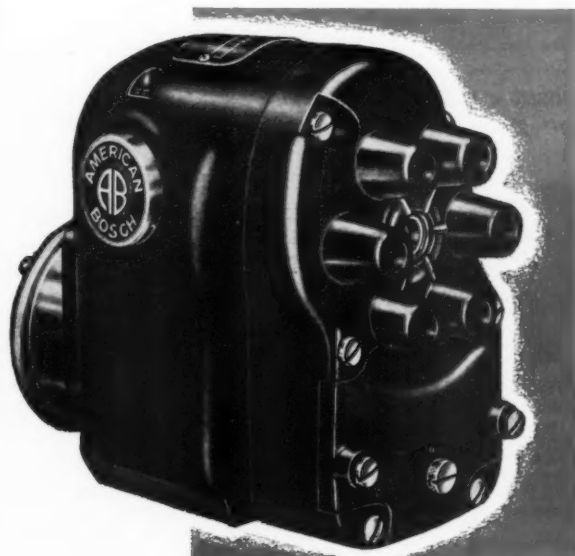
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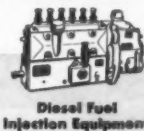
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Write today for Magneto application data on your low or high tension ignition engines. We'll give you the name of a nearby AB Service Agency, a part of the most widespread and efficient Magneto service facilities in the world. American Bosch Corporation, Springfield 7, Mass.



AMERICAN BOSCH





Small but intricate concrete pours all along the project were a construction feature of the Boulder Creek Supply Canal near Longmont, Colo. Here, workmen are building a drop structure. A Jaeger truck mixer supplies the concrete, and Dart vibrators are in use. Ray Day Photo

Numerous Small Pours Complicate Canal Job

Construction of irrigation system artery entails winter concrete work, close scheduling of excavation operations

NEAR LONGMONT, Colo., where the base of the high Rockies flattens off toward farmland on the east slope, the Kansas City, Mo., contracting firm of Bales & Kite and the U. S. Bureau of Reclamation are forging the next-to-final links in the Colorado-Big Thompson project. And while these finishing touches are a far cry from many of the earlier phases of the 15-year project, construction problems are running true to form. They are tough, numerous, and interesting.

Bales & Kite has a \$972,000 contract calling for construction of 13.6 miles of the Boulder Creek Supply Canal, a small 200-cfs distribution artery leading from the St. Vrain Canal to irrigated land on the east slope. Complicating the project are 140 structures in the 13.6 miles, plus the necessity for scheduling their construction to tie in with the irrigation season.

The 140 structures are, of course, designed for the small capacity of the canal, with the biggest mono-

lithic pour some 42 cubic yards. The average per pour is only 4 cubic yards, and every structure involves from 2 to 7 pours, with an average of 4. All told, that represents approximately 600 concrete pours.

Excavation, too, presented difficulties. Because of the irrigation season at the south end, work had to be carried on in drier ground at the north end until the close of the watering season. Then, in a few weeks, enormous yardages had to be

handled at the south end. This close scheduling was done successfully by skilled men using modern equipment.

Closing Stages Represented

The Bales & Kite contract represents a closing stage in one of the most imaginative reclamation projects ever conceived by the USBR. The basic part of the plan is the trans-mountain diversion of Colorado River water from the west slope to the east slope of the Colorado

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CONTRACTORS AND ENGINEERS



Rockies. Badly needed water flows under the Rockies through a 13-mile tunnel, then drops through a series of tunnels and hydroelectric plants to the system of canals on the east side. The Boulder Creek Supply Canal is but a small part of this complex distribution system. Many other sections already are completed—Alva B. Adams Tunnel, Granby Dam, Shadow Mountain Reservoir, Ram's Horn and Prospect Mountain Tunnels, Olympus Dam, Rattlesnake Tunnel, and Pole Hill Tunnel. Already, some of the hydroelectric plants on the east slope are drawing kilowatts from the rushing water on its long power drop toward the land down along Boulder Creek.

As the big project moves into its final stages, there is evidence everywhere that the cost has been fully justified. New industries are springing up, and they need power. Cities are mushrooming, and many of them can use additional water. Colorado is producing more crops.

The Boulder Creek Supply Canal, designed to carry a hydraulic Q factor of 200 cfs, has a 12-foot bottom, $1\frac{1}{2}$ to 1 side slopes in earth, and $\frac{1}{2}$ to 1 side slopes in rock. Plans call for about 20 per cent of the project, largely through porous rock sections, to be earth lined. Average water depth at full capacity will be 4.59 feet. The compacted earthen banks will be 5.5 feet high and topped by 1.3 feet of uncompacted material. Density specifications in the compacted zones call for 95 per cent, measured by the modified method. The canal banks are being finished off in two berms—a 12-foot berm for use as an operation and maintenance road and an 8-foot berm on the opposite side.

The canal structures include 58 metal-pipe flumes, 6 corrugated metal-pipe drainage inlets, 24 concrete-pipe culverts and crossings, 13 siphons, 2 turnouts, 7 drainage inlets, 4 overflows, 6 drops, 11 bridges for county roads, one Parshall flume,

(Continued on next page)

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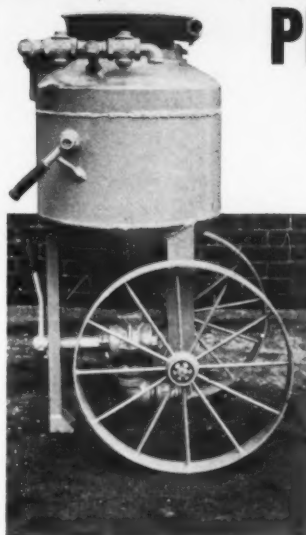
Here is an economical machine that's easy to operate and can save you a lot of time. The PREHY grouter is ideal for:

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Marion all-welded trailer bodies are constructed to minimize sagging or twisting when loads are uneven or extra heavy.

Marion Telescopic hoists are made of heavy, seamless steel tubing polished to a mirror-like finish to greatly reduce wear. The jacks are connected to the frame in such a way as to prevent binding. They are designed to give equalized lifting power, regardless of the load. Stability is maintained by rigid underbody construction.

Marion Telescopic hoists are especially adapted for extra heavy loads. They provide the advantages of light weight compactness, low mounting and greater efficiency. Whether your requirements call for a standard or special body and hoist to meet individual problems, Marion's "Designed on the job" models withstand greater load-carry capacities . . . require less maintenance and fewer man-hours per ton payload. See your nearby Marion Distributor for all details . . . or write direct . . . today.



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Portable OTC 50 Ton Hydraulic Ram with Adaptors Pulls or Installs on the Job or in the Shop

Pulling International TD-24 sprocket with OTC 50 Ton Set.

Sets For Caterpillar, Allis-Chalmers and International Harvester

Save Time, Labor—Reduce "Down-time." Now for the first time the tough, time consuming, costly job of pulling industrial tractor sprockets can be done in minutes by one man with the new OTC 50 Ton Ram and adaptors. Sets are available for each make shown above or a Universal Set to fit all three makes . . . If you have a 50 Ton OTC Ram, you need only the adaptors. Three types of pumps are available . . . For complete information write your jobber or Owatonna Tool Co. giving make of tractor used.

Ask about OTC Hydraulic Universal Puller Sets too!

OTC 50 Ton POWER-TWIN Hydraulic Ram may be used for hundreds of tough pulling and installing jobs including the above.

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one turnout and wasteway, and 16 miscellaneous structures.

Quantities of project material include 323,000 cubic yards of common excavation, 58,200 cubic yards of rock excavation, 20,000 cubic yards of excavation from borrow, 50,000 cubic yards of earth lining, 25,000 cubic yards of drains excavation, and 2,250 cubic yards of concrete in structures. Scattered as these quantities are over 13.6 miles, the construction scheme has been a jigsaw puzzle in scheduling the various structures, canal sections, and other work.

Canal Excavation

When Bales & Kite moved in last July 20 to start the job, the company had 400 calendar days to finish the work. When CONTRACTORS AND ENGINEERS visited the job, crews were on schedule aiming for the final completion date of June 1, 1954.

A 56-foot-deep major rock cut was subbed to the Ogallala, Nebr., firm of Cass Co. Contractors, Inc. Another Denver firm, Emerson S. Ellett, Inc., held a subcontract for the installation of all precast-concrete pipe, including excavation and back-filling.

The big 56-foot rock cut was done by Cass Co. in shale and hard limestone rock, and it was necessary to carry the canal around the point of a sharp hill and onto the plains country below. Cass used a Gardner-Denver 315-cfm compressor and a Joy wagon drill, along with Timken steel drill bits, to sink the required powder holes. The bits proved practically indestructible in the relatively soft rock, and drilling life as high as 1,000 linear feet between sharpenings was reported. The longest steel was 16 feet, and the drill holes were bottomed at 2½-inch diameter on a square grid pattern of 7 feet.

Du Pont 40 per cent powder, loaded without springing, did the rock breaking. Delay caps were used effectively here, and the ½ to 1 canal slope was shaped quite accurately by the use of delays up to 200 milliseconds. In a shot, the center was blown out first, with delay shots then kicking in from the sides to form the slopes.

Excavation of this broken material was handled by a Lorain 2-yard shovel, which loaded to a fleet of International dump trucks. The spoil area for this material is not very far away from the site, so four trucks kept the Lorain shovel busy.

The main canal excavation program moved amazingly fast. Approximately 12,600 linear feet of the canal on the north end was excavated from July 20 to September 10. Then the equipment fleet moved in on the south end and, between September 10 and December 4, substantially finished the 7 miles of excavation work. It was quite a construction feat, because in many cases the dirt had to be rehandled or handled under great difficulty.

The main excavation fleet of Bales & Kite consisted of five Caterpillar DW10's, with Caterpillar D8 pusher tractors to aid loading. There were also two D8's and a pair of Caterpillar 70 scrapers for short-haul work and canal trimming. There were three D7's and a pair of D6's on the job for dozer, sheepfoot roller, and allied work. Processing equipment with this spread consisted



A trench for a siphon structure is dug by a Bay City backhoe. The Lock Joint precast pipe sections in the background will be used in constructing the siphon. Ray Day Photo

of two Tampo sheepfoot rollers, a 1,000-gallon truck-mounted water tank, and a 3,200-gallon tank truck. A Wooldridge ripper was used in some of the shale material, and a Caterpillar No. 12 motor grader was employed in haul-road maintenance, canal shaping, and similar work.

In addition, there were a Koehring 605 dragline, a Northwest 6 with a 1½-yard bucket, and a P&H ¾-yard machine. These machines handled structure excavation, direct excavation, and casting. All the equipment was shipped from Kansas City to the Colorado job by rail.



Lying directly at the foot of towering Cheyenne Mountain, the Broadmoor with its private golf course, lake, ice palace and rodeo stadium is one of the famous resort hotels of the world.

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Grades too steep and curves too sharp for the ordinary rear drive, front steer motor grader all in a day's work for the Austin-Western Power Grader, thanks to the greatly increased traction and power-at-the-blade of its exclusive All-Wheel Drive, and to the unequalled "turnability" of its exclusive All-Wheel Steer.

To the average owner, not faced with the problem of climbing mountains, ability to work successfully up grade means corresponding ability to move more material on the level . . . ability to negotiate mountain curves spells maneuverability that saves time on every job.

The DW10 excavation called for canal increments about 1,000 feet long. Between these sections, and occasionally within the sections, earth plugs were left in so that the machines could get in and out. The earth plugs between major canal sections were later removed by dragline.

Material consisted generally of clay, of clay-gravel, and in many cases, of soft shale rock which often could be loaded without the help of the Wooldridge ripper. It loaded well, and most of the soil had sufficient clay content to pack well under



Push loaded by a Cat D8 tractor, a Caterpillar DW10 picks up a load of excavated material as the new canal begins to take shape.

Ray Day Photo

compactive effort. The average optimum moisture content of this material is 15 per cent.

Part of the excavation difficulty was concerned with this moisture content. Because the fall months of 1953 were notoriously dry, about 40,000 gallons of water per shift had to be hauled from nearby wells, canals, and drain ditches. It was impossible to compact the soil to USBR standards by spreading the dry material and then adding water. The only satisfactory method was to rip the soil and apply water about 10 days to two weeks before working on the berm. With the optimum moisture content thus present in the soil, it was possible to develop 95 per cent compaction in from six to eight sheepfoot roller passes, especially when the soil was spread in 6-inch lifts or even less.

Along virtually the whole canal, at least some buildup of side berms was necessary. In many sections, of course, the whole canal flows between high man-made earthen dikes. It was in such places as these that the soil compaction job was difficult.

In order to build the canal banks to the required 95 per cent density, it has been necessary to add approximately 2 feet to the canal sides and bottom during construction and to shave that excess material away later, so that sound earth is then exposed. The earthwork program was so arranged that as much yardage as possible was placed during the fall months. During the winter, when frost penetration is shallow and compaction work with water out of the question, this excess earth was removed. A Caterpillar 70 scraper, towed by a D8, took the excess material away to within about 3 inches of grade. The final shaping was done by the Caterpillar No. 12 motor grader and the last pickup of material made from the 12-foot bottom of the canal.

There are many places, of course, where flumes will cross over the new canal. At any of these points, equipment can no longer maneuver after the concrete footings are in. It takes a great deal of advance planning, therefore, to schedule the dirt work so machines can stay ahead of structure work and still perform at good production. This has been arranged by programming the dirt work and the structures according to a master plan, and adhering strictly to that plan.

The excavation work by Ellett was handled by a Bay City 2-yard backhoe. The precast Lock Joint concrete pipe sections were then set in the structure excavations. Structure backfill immediately adjacent to the concrete was placed by small Ingersoll-Rand pneumatic hand tampers, with 105-cfm compressors supplying the air. It was necessary to use extreme care in placing the backfill by this method in order to develop the high densities required.

Pint-Size Concrete Work

There have been many large concrete jobs on the Colorado-Big Thompson project, but none has been more difficult than the small structures on Bales & Kite's Boulder Creek job.

Forming and placing this concrete has proved so difficult that the average cost to the federal government



the BROADMOOR
COLORADO SPRINGS, COLORADO
February 15, 1954

Austin-Western Company
Aurora
Illinois

Gentlemen:

The 88-H Power Grader we purchased in 1952 from your Denver distributor, Liberty Trucks and Parts Company, has given an excellent account of itself. We use it mostly on what "Believe It or Not" Ripley has called the "World's crookedest highway", leading to Lodge, radio and TV transmitters atop 9,300-foot Cheyenne Mountain. The upper 4 1/2 miles of this highway, from the Will Rogers Shrine of the Sun to the summit, are gravel which must be maintained daily as traffic during the summer months average 640 cars daily. In the 4 1/2 miles are 13 switchbacks of the hairpin variety. The average grade is 7%. Using the power and traction of its All-Wheel Drive, the 88-H works upgrade with ease and speed without backing - turns which the ordinary front-steer grader could not negotiate without several back-ups, loss of time and seriously impeding automobile traffic.

That we are highly pleased with the all-around performance of the 88-H goes without saying.

Very truly yours,

W. L. Wickman
Superintendent of Maintenance



the hairpin switchback shown in the long shot at the left, the grader front and rear wheels in opposite directions to complete backing a turn that would require several time-consuming backups of a front steer grader of comparable size.



Heavy traffic on the "world's crookedest highway" makes it essential that the gravel surface be maintained in perfect condition every hour of the day. Like all Austin-Western Power Graders, the "88-H" has ample traction for work uphill as well as downhill.

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is about \$85 per cubic yard. Some of the warped transition sections are difficult to form, and in one intricate change from a 5½-foot-square to a 5½-foot-round section, pie-shaped pieces built to fit together and be dismantled for re-use had to be used.

The forms are built in a centrally located carpenter shop and trucked to the sites for installation. The exception comes when a structure is sufficiently large and rectangular to allow use of Uni-form steel and plywood forms. Uni-forms are being used in this manner for about 20 per cent of the forming area in the job. The pint-sized structures require about 40 square feet of form area per cubic yard of concrete. Universal snap ties are being used on the wood panel forms and strap ties on the Uni-forms.

Where wooden forms are made, the plan is about the same in all cases. Facing consists of plywood, covered by form oil and nailed to 2 x 4 studs. Double 2 x 4 wales are used to support the forms and catch the form ties.

Concrete is being placed with Type V cement containing Protex air-entraining agent, and is calculated for 3,000-pound compressive strength at 28 days. Golden Transfer Co. of Longmont, a commercial supplier of ready mix concrete, transports the material to the job by truck mixer. The concrete is often chuted directly from the truck mixer into the forms, but in some cases one of the cranes and a Gar-Bro bucket are necessary. Two gas-driven Dart vibrators are on hand when a pour is made so that good consolidation of the material can be obtained. Final

curing is by Hunt Process Clear white-pigmented membrane.

The concrete work was protected from cold through the winter months. Field men had no choice about pouring during the winter, as the work had to be done when irrigation was not going on.

Two methods were used to heat the green concrete. For the small pours, a tarpaulin cover and ordinary kerosene-burning stoves were used, one stove to a pour. For larger concrete blocks, the Little Bertha 2-bottle gas heater, manufactured by L. B. White Co. of Onalaska, Wis., was used under canvas tarpaulin covers. Despite these complications, the concrete work moved along just as efficiently as the canal excavation, and the numerous tiny pours were set up and made on schedule.

A further extension of this canal



B. H. Duffe, project manager for Bales & Kite, Kansas City, Mo., and Claude Sullins, excavation and equipment superintendent, confer on the job site. Ray Day Photo

and the construction of a small reservoir for the city of Boulder will complete that part of the Big Thompson project. Only a few other scattered remnants will then remain to finish this reclamation job.

Personnel

The Boulder Creek Supply Canal was designed and is being supervised by the Denver office of the U. S. Bureau of Reclamation, with L. N. McClellan as chief engineer, Avery Batson as regional director, and George Highley as construction engineer.

The staff for Bales & Kite includes B. H. Duffe, project manager; Claude T. Sullins, excavation and equipment superintendent; and Jesse McDonald, structures superintendent. Frank Scholes is Sullins' assistant superintendent on the dirt work.

THE END

News From Armco Steel

Negotiations have been completed by Armco Steel Corp., Middletown, Ohio, for the acquisition of Southwest Steel Products, Houston, Texas, producer of fabricated reinforcing bars, bar joists, roof deck, and other products used in construction.

The new wholly owned subsidiary will continue to be managed by Russell L. Jolley, president of Southwest.

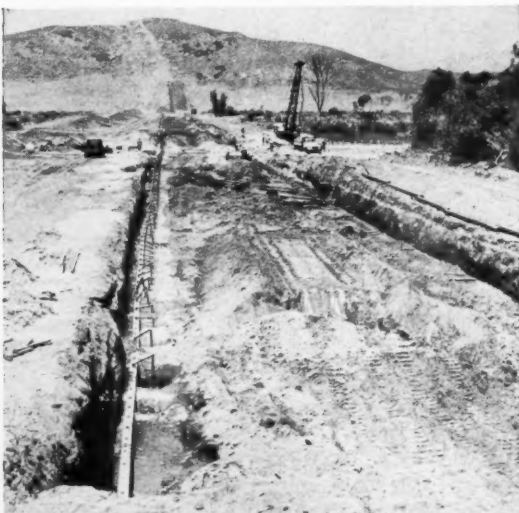
At the Armco plant in Middletown, work is under way on a \$430,000 expansion of the fabricating division. The project, adding 32,000 square feet of floor space to the plant, is expected to be finished within the year. Next month, the company expects to start work on a \$1,250,000 construction project at its East Works plant.

Earnings on Oklahoma Pike

The Oklahoma City-Tulsa turnpike will have a reserve of about a half million dollars after its first year of operation and after bond interest and expenses are paid.

WET

The quicksand is being predrained by efficient operation of Stang Wellpoint System.



to

DRY,

Excavation progresses in the dry. Pipe laid safely on schedule, with no ground water worries.



and

WHY!

U.S. Bureau of Reclamation engineers were faced with a challenging problem on the San Diego Water Supply Project. The San Diequito River Crossing of the San Jacinto-San Vicente Aqueduct called for the laying of 2,000 feet of large diameter concrete pipe in unstable water-bearing soil. Maximum depth was 18 feet below ground water table. After consultation with Stang engineers, a wellpoint system was expertly installed to predrain the work area. Digging "in the dry," the job progressed speedily and economically. Pipe was easily laid as planned. Call on Stang experience and equipment to solve your water handling problems—any size, any type, anywhere. 84-page catalog furnished free upon request.

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Telephone: BRoadway 4362

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No. 2 Broadway
Telephone: WHitehall 3-0565

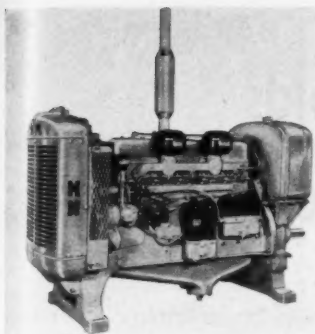
HAVE YOU
SEEN



the
Davis Pit-Bull

SEE AMERICA'S MOST
VERSATILE EQUIPMENT
ON PAGE 6

CONTRACTORS AND ENGINEERS



A Minneapolis-Moline six-cylinder diesel engine, Model D425-6.

Diesel Power Units

■ Diesel power units in new sizes are now in production at the Minneapolis-Moline Co., Minneapolis 1, Minn. Both the D283-4 four-cylinder and D425-6 six-cylinder units have a $4\frac{1}{4}$ -inch bore and a 5-inch stroke. The manufacturer calls attention to the "energy cell" design, said to reduce fuel consumption and to obtain a cleaner exhaust for longer engine life.

An American Bosch single-plunger fuel-injection system, an improved water pump, and two water-coolant nozzles for each fuel-injector nozzle are features. Cylinder blocks are cast in pairs and can be removed from the crankcase. There is extra crankcase depth below the center line of the crankshaft, and a heavy rigid-cast base pan is flanged and bolted to the flywheel housing.

The heavy-duty aluminum-alloy pistons used are cam-ground and tin-plated. The liberal size of the crankshaft journals and the large bearing areas make possible continuous heavy-load operation. A 3-stage fuel-filter unit and large-capacity oil filters are other features.

For further information write to the company, or use the Request Card at page 18. Circle No. 582.

Improved Form Tie Has Anti-Bond Coating

■ The addition of a breakback coating to its panel ties and washer ties is reported by the Symons Clamp & Mfg. Co., 4249 Diversey Ave., Chicago 39, Ill. This new coating reduces the bond between concrete and steel, making it easier to break the tie an inch inside the wall.

The company points out that the air-entraining agents and additives being used more and more in concrete have increased the need for this type of coating.

For further information write to the company, or use the Request Card at page 18. Circle No. 561.

Paving-Breaker Bulletin

■ A bulletin on its line of Silver Streak paving breakers is available from the Joy Mfg. Co., Oliver Bldg., Pittsburgh 22, Pa. Operating features are covered in eight pages of detailed description, specifications, and photographs.

Product features such as cadmium plating and the patented dual valve are described. The paving breakers are built in four sizes. In addition to breakers, the bulletin covers the company's air compressors, rock drills, and other related tools.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 562.

Trailer-Type Spreader Is Cab Controlled

■ A new bottom-dump hauling and spreading trailer has been placed on the market by Timpte Bros., Inc., 40th and York Sts., Denver 5, Colo. The Timpte Gilpatrick spreader has a hauling capacity of 10 to 12 yards.

The dumping operation is cab controlled so that the unit spreads gravel and other materials while the machine is moving. This enables the operation to proceed at full speed at all times and eliminates the need for the extra man usually required for spreading.

Another feature of the spreading trailer, according to the manufac-

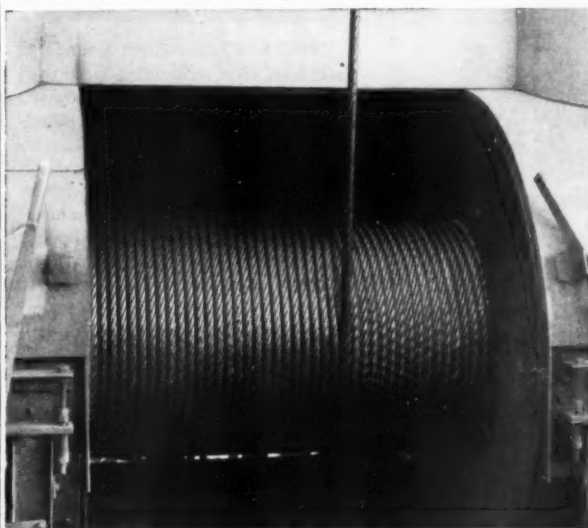
turer, is that it can be pulled by any idle tractor.

For further information write to

the company, or use the Request Card that is bound in at page 18. Circle No. 570.



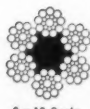
The Timpte Gilpatrick spreader is a bottom-dump trailer controlled from the operator's cab.



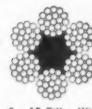
OVERCOMING ABRASION—Wire rope takes a beating on some jobs by abrasion. It is squeezed in multiple layers under tremendous pressure on rotary drilling drums in the Texas oil fields. In the Northwest it drags under heavy logs.

In this Arizona mine it is scraped over rocks to operate a slusher. Everywhere it is rubbed severely on winches that do not wind smooth. Under such conditions Red-Strand 6 x 19 Seale wire rope will last longer and save you money.

**What can you
do better with 6x19
Seale Red-Strand?**



6 x 19 Seale



6 x 19 Filler Wire

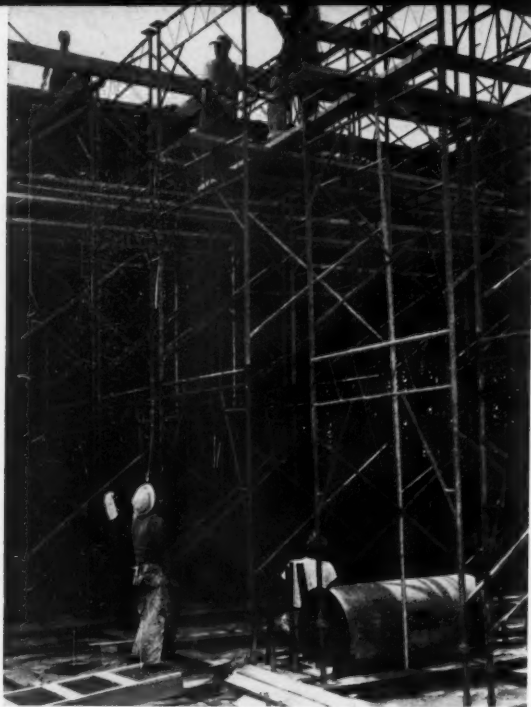
6 x 19 Seale has the same strength and weight as the more frequently used 6 x 19 Filler Wire, but the arrangement and size of the wires is different. You can see in the diagrams that the outer wires are fewer in number and larger in size. They provide *high resistance to abrasion* and greater wearing quality with somewhat less flexibility.

It's the perfect rope for certain jobs. Would it solve a problem for you? Be less trouble? Save more money? A Leschen man is near you. Perhaps he can help. Leschen is providing *longer-than-expected* wire rope service to industry everywhere.

Send for the 64-page Leschen Wire Rope Handbook. It describes Seale and all other Red-Strand wire rope constructions.

LESCHEN WIRE ROPE DIVISION
The Watson-Stillman Company
(A SUBSIDIARY OF H. K. PORTER COMPANY, INC.)
St. Louis 12, Missouri





Carpenters level shoring for the Colgate-Palmolive Co. service building in Jersey City, N. J., as other workmen place stringers, joists, and plywood for the concrete pours. Adjustments to height are made on the legs of the Patent Trouble Saver frames.

Tubular Steel Scaffolds Shore Floor Slabs

Concrete pouring goes quickly following extensive work on foundation of 4-story waterfront building

NEARLY a half-million pounds of sectional steel scaffolding were used to shore concrete floor slabs during construction of a four-story industrial service building for Colgate-Palmolive Co. in Jersey City, N. J. Because the heavy loads and high ceilings would have required a cumbersome network of timber shoring, George A. Fuller Co., New York, N. Y., general contractor, decided to use steel scaffolds. The job is believed to be the largest ever undertaken on which prefabricated scaffolding components were used as shoring.

The 466 x 200-foot building required about 6,500 Patent Trouble Saver scaffolding frames, each 5 feet wide, to shore the 10-inch flat slabs and 5-inch drop heads. Two 6½-foot-high frames were tied 6 feet apart with pivoted cross braces to form the base of each shoring unit. In addition, 300 Trouble Saver ladder scaffolds, 24 inches wide, were used to support spandrel forms.

To provide the proper height for the 22-foot first floor and 19-foot second and third floors, 6½ and 5-foot-high frames were placed on top of the base frames. The adjustable



1 yard Scoopmobile MODEL LD-5

Compare! 4-wheel planetary drive—4-wheel power steering—all-hydraulic operation—Pow-R-Flex twist-turn flexibility—114 h.p. engine—8 equal speeds, forward or reverse—road speeds to 23 m.p.h. See it in action before you buy!



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... FROM CENTRAL MIX PLANTS
... FROM LONG HAULS
... FROM HIGH COST OF MOVING
AND ERECTING A PLANT



...The WILLARD "Task Force"

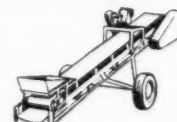
A COMPLETELY MOBILE SETUP for batching and mixing up to 30 cu. yds. per hour of specification concrete using bulk cement, or 21 cu. yds. using sack cement. With this low cost mobile ready-mix plant you can handle concrete pouring jobs in any locality without dependence upon local sources.

One man plant crew with truck mixer drivers handles the whole operation—he picks up and weighs stock piled aggregates with the self-loading Willard Weigh-Batcher... cement is added... he dumps material into a hopper from which it is carried by conveyor to the truck mixers.

The Willard "Task Force" has the capacity to keep several truck mixers busy and to handle most average concrete jobs. It offers a way to take these out-of-the-way jobs at your own price. Get the facts; write today for the "Willard Way" booklet.

Manufactured in Los Angeles, California and Galion, Ohio.

WILLARD CONCRETE MACHINERY SALES CO.
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BATCH and MIX on the job!

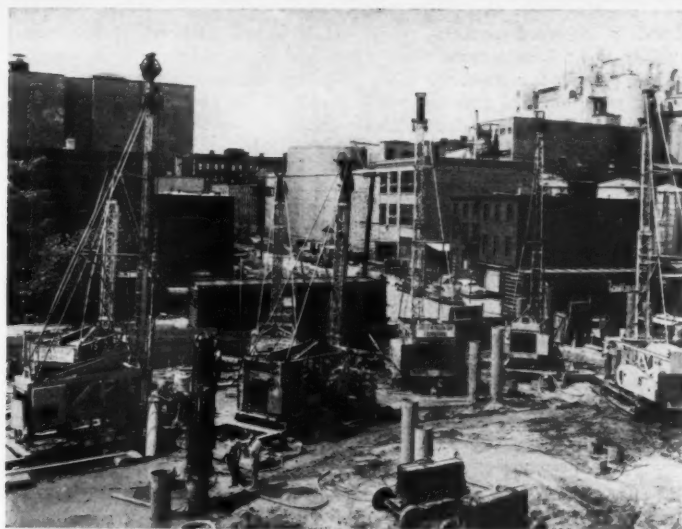
CONTRACTORS AND ENGINEERS



After base plates are nailed to mud sills, the scaffold unit is raised by means of the 20-inch adjustable leg.

legs under the base frame permitted quick adjustment to exact height. Base plates under the legs were placed on wood mud sills. The forms consisted of 5/8-inch plywood on 4 x 4 joists placed across 4 x 8 stringers. Inverted base plates on top of the scaffolds supported the stringers.

Fuller ordered enough shoring to handle about half of one floor at a time, counting on at least six re-uses.



Seven Bucyrus-Erie drill rigs break through obstacles encountered during the driving of 22-inch pipe piles. Spencer, White & Prentis, Inc., New York City, did the pile driving and drilling.

Pours covered about 7,000 square feet, or ten 25-foot-square bays. Generally, 350 to 400-yard pours were made about twice a week. Forms were stripped after seven days.

The huge structure is being built for Colgate-Palmolive Co. to handle many of its warehousing and shipping operations. An extensive system of overhead conveyors will connect the building with other

structures in the spacious waterfront plant. Inside the building, material will be moved by hydraulic elevators and pallet lifts.

Foundation

When all the old waterfront structures had been removed from the site, Spencer, White, & Prentis, Inc., New York, was called in to drive 454

(Concluded on next page)



A Bay City and a Lorain crane hoist buckets of ready-mix concrete to hoppers on the second floor of the service building. Workmen load buggies from the hoppers and wheel the concrete to the pour.

C&E Staff Photo



●TENNANT Sweeper cleans 48" path; replaces 3 to 12-man crew.

New Compact Machine Sweeps Gutters Walks and Alleys at 1/5 Usual Cost

BY SWEEPING congested areas with a new type power sweeper instead of pushbrooms, Akron, Cleveland and several other cities may save up to 80% this year in labor costs.

The new sweeper, shown at the APWA meeting in New Orleans last fall, is a compact heavy-duty machine. It cleans a 48" path and turns easily in a 5-ft. radius.

Its sweeping capacity is reported to equal that of a 3 to 12-man pushbroom crew.

Sweeper Cleaner Than a Crew

The sweeper has a powerful brush-and-vacuum system which eliminates need for water spraying or "wetting down." A rotating curb-brush sweeps leaves, dust and litter into main path of the machine.

A 36" brush, in a vacuumized compartment, throws dirt forward into an enclosed 9 cu. ft. hopper. Sweeping speed, with 2-speed transmission, is 1 1/2 to 8 MPH.

Pays For Itself in 6 Months

The new sweeper has proved most successful in "mechanizing" whitewashing work in special congested areas where big sweepers can't be used—such as gutters in downtown areas, walks, alleys, garages, driveways, etc.

In such areas a single machine is said to pay for itself in 1 to 6 months.

Air terminals, auditoriums, piers and parking lots also can be swept most economically this way.

For details, please write or wire to the G. H. TENNANT CO., 2534 N. 2nd St., Minneapolis 11, Minnesota.

SUNFLOWER ROTARY CUTTERS

Modern, Multi-Purpose Implements for

- MOWING Rights of Way
- CUTTING Weeds, Brush, Briars
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Cuts a 60-in. Swath . . . Fast!

MODEL F-2
FOR 3-POINT
HITCH

OTHER MODELS
FOR ALL MAKES
OF TRACTORS



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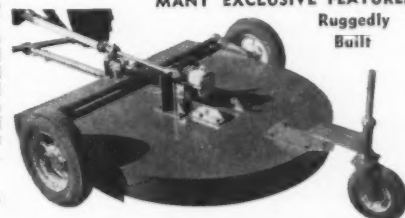
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THROUGHOUT the nation and in many other countries, Sunflower Rotary Cutters have won widespread popularity by their dependable performance, low initial cost, and economical operation.

They are modern in design. Sturdy in construction . . . positive in results. An extra strong, heavy steel gear box is now supplied as standard equipment with all our 60" Cutters.

Made in the one right size for most uses. Cut full 60" swath—adjustable heights 2" to 15". Come complete with steel gear box, SUNFLOWER special design gyral-action blades and many other new and modern improvements. All steel mandrel—no cheap castings—FIELD TESTED — PROVED — GUARANTEED.

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MODEL HD-53 ➔

Trailer Model W/Universal Hitch for All Tractors — Also 3 Point

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The Sunflower Line of Implements has been readily accepted the nation over. 1954 sales are more than 50% ahead of 1953! Write today for new catalog pages and current LOW prices.

SUNFLOWER INDUSTRIES, INC., 599 So. Kansas Ave., OLATHE, KANS.

(Continued from preceding page)

open-end pipe piles to bedrock. The 22-inch-diameter piles averaged about 40 feet in length and were driven in two, three, and four-pile clusters.

Where the subsurface conditions were good, the foundation work consisted of driving the pipe piles to bedrock, cleaning them out, and then filling them with concrete. Up to 20 piles could be driven in 8 hours.

But less than half of the piles went down without any trouble. The warehouse site had been occupied at one time by several steamship lines, and the remains of old piers and sunken vessels were lodged deep inside the mat of waterfront silt. Pile driving was extremely difficult in these areas. In fact, it took nearly two weeks to drive one pile because boulders and timbers were encountered along its entire length.

At the peak of the foundation work, Spencer, White, & Prentiss had seven Bucyrus-Erie drill rigs with heavy star bits in operation breaking through the obstacles.

The general procedure was to drive the piles until an obstacle was encountered. Most of the driving was done with Vulcan No. 1 steam hammers in the leads of a Lima 802 crane. Steam was supplied by a Littleford generator mounted on the rear of the Lima. When an obstacle was hit, the driving rig moved out and a Manitowoc crane took over to clean out the inside of the pipe. This was done with a high-pressure jet of air and water blown through a 3-inch pipe suspended from the crane. About 1,000 cfm of air was required to operate the jet. Compressed air was supplied to the three cleaning rigs on the job by a battery of five portable compressors—two Ingersoll-Rand 600's and three Chicago Pneumatic 500's.

Drilling

When the pile was cleaned out, a drill rig was brought in to break through the obstacle. This was done by dropping a heavy star bit through the pipe. Sometimes the materials encountered were removed with special suction blowers. Because of its resilience, timber proved very difficult to break.

After the obstacle had been removed, the Lima resumed driving until the pile hit bedrock or, in many cases, another obstacle. When the pile was finally driven and cleaned to bedrock, it was filled with concrete.

Driving was made more difficult because the high loads required that each pile be placed accurately. Piles were designed to carry 230 tons and tested nearly 345 tons without appreciable settlement. Two piles were tested by jacking them against a double 36-inch beam tied to two pipe piles anchored into bedrock.

As pile clusters were completed, footings and tie beams were formed and poured. Nearly 20,000 cubic yards of sand fill was then trucked in and spread over the area. Heavy dozers were run over the fill to produce the required compaction. The 7-inch first floor was poured directly on the compacted fill and reinforced with 6 x 6 No. 6 mesh.

All the higher floors were poured on the scaffold forms described previously. Ready-mix concrete was

hoisted in 1½-yard buckets by a Bay City and a Lorain crane working just outside the building. The buckets were emptied into hoppers from which hand buggies were loaded. A Monorock floor finish was worked into the surface with White-man rotary machines. This was done by the General Floor Co., Inc., of New York.

Sikacrete was applied as a cure. In cold weather, tarps and coke-fired salamanders prevented the concrete from freezing.

Exterior walls were faced with brick backed by Waylite block. A steel frame supported the built-up roof.

Personnel

T. H. Walker was construction manager and Charles Anderson was superintendent for George A. Fuller

Co. G. E. Hebert represented Albert Kahn Associated Architects & Engineers, Inc. R. T. Helm is head of the building department, and E. J. Reddert is chief engineer for Colgate-Palmolive Co. THE END

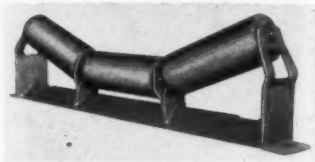
Conveyor-Belt Carrier

■ A new conveyor-belt carrier offered by the Stephens-Adamson Mfg. Co., Aurora, Ill., has 4-inch-diameter rollers that have spun ends and turn on precision ball bearings. Noncorrosive die-cast labyrinth seals protect the bearings. Although Alemite fittings are provided for re-lubrication, sufficient grease is contained in the bearing chamber to operate the carrier rolls on a life time basis.

The carrier frames are of jig-welded steel construction. The rolls

are interchangeable and can be inserted or removed from the brackets without tools. A kit is available for lubrication from one side of the carrier.

The 745 carrier is available for

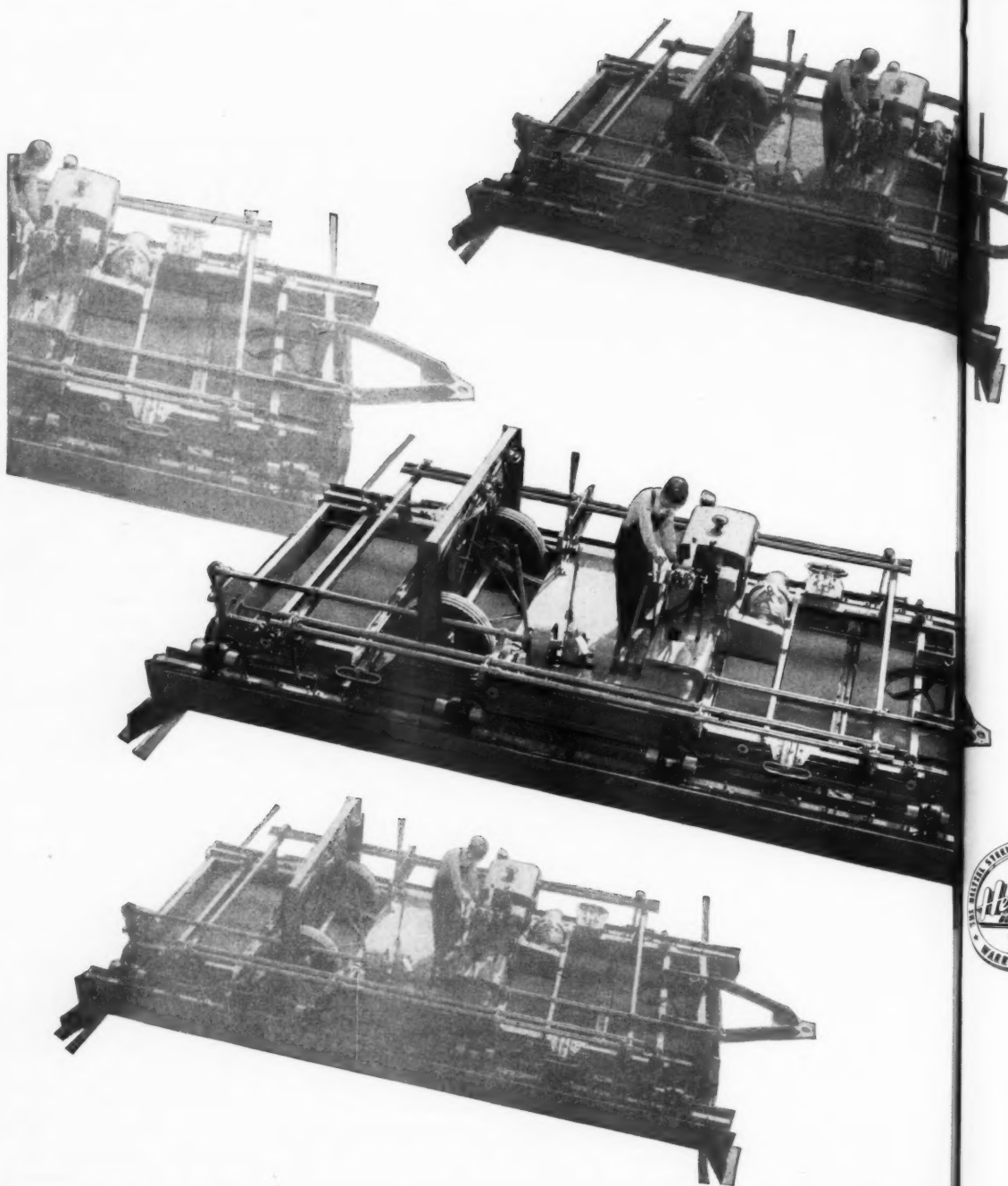


The new Stephens-Adamson conveyor-belt carrier.

stock shipment in sizes for 18, 24, 30 and 36-inch belts.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 587.

Leading midwest contractor owns



Bucket Loader Has Swivel Conveyor

■ A heavy-duty bucket loader, with a hydraulically operated swivel discharge conveyor, has been announced by the N. P. Nelson Iron Works, Inc., 820 Bloomfield Ave., Clifton, N. J. The unit is available in two models. The Model P-11B is mounted on rubber tires, and the Model Q-11B is mounted on crawlers. A loading capacity up to 4 cubic yards per minute is reported.

The swivel discharge conveyor turns 180 degrees, discharges at heights of more than 14 feet, and has a reach of over 11 feet. This height and reach allow large trucks with sideboards to be loaded from front to rear without maneuvering back and forth under the chute.

With the discharge conveyor



The Nelson bucket loader features a swiveling discharge conveyor that turns 180 degrees

swinging 90 degrees to either right or left of the front discharge point, it is unnecessary to spot trucks in a

fixed loading position. The conveyor turns, lowers, or raises independently of the bucket boom and

permits trucks to stay in position as the loader moves into the material.

The complete hydraulic system, antifriction bearings, avalanche plates, spring-mounted bumpers, and an extra-heavy conveyor belt are included as standard equipment. The unit's boom tilts down for highway transport. The P-11B weighs 17,500 pounds and the Q-11B, 18,700 pounds.

For further information write to the company, or use the Request Card at page 18. Circle No. 538.

New Tandem Roller

■ The new Ingram tandem roller features simplicity of construction and operation, according to the Acme Iron Works, Box 2020, San Antonio, Texas. The roller is made of one-piece fabricated steel components.

The rolls are made of heavy steel plate, rolled to form a thick tire which is welded to the cross braces and disks. They are machined in one piece for concentricity and provide an accurate face for the complete assembly. The disk has ports for adding ballast, which allows a convenient variable weight for the 5 to 8-ton roller. The compression roll is 50 inches wide and 52 inches in diameter. The steering roll, also 50 inches wide, has a diameter of 40 inches. Compression per inch of roll width is 201 pounds for the compression roll and 122 pounds for the steering roll.

A feature of the roller is the full-floating-type axle which is used with straight-face bronze bushings for shock absorption. The transmission is of the sliding-gear type, with two forward and two reverse speeds. The operator uses a single lever for changing direction. The speed of the roller is controlled by a variable governor and ranges up to 5 mph.

Power comes from a 6-cylinder Chrysler engine which develops 56 brake hp continuously at 2,000 rpm. The roller is equipped with Chrysler's fluid coupling, the Gyrol drive that protects the machine against damaging shock overloads and reduces excessive clutch wear. Both rolls have sprinklers and cocoa mats. The water is supplied by gravity from a 135-gallon tank.

For further information write to the company, or use the Request Card at page 18. Circle No. 577.

Hard-Facing Alloys

■ Three new cobalt-chromium-tungsten hard-facing alloys in welding-rod form are announced by Crobalt, Inc., 2800 S. State St., Ann Arbor, Mich. Known as Crobaltite alloys, these materials are applied to steel and cast iron parts to provide hardness and resistance to abrasion, corrosion, oxidation, and impact. They retain these properties at red heat, can be heated to 1,600 degrees F with no permanent loss of hardness, and are not affected by repeated heating and cooling.

The alloys are applied by oxy-acetylene torch or inert arc welding, either manually or by semiautomatic machine, using standard hard-facing procedures.

For further information write to the company, or use the Request Card at page 18. Circle No. 598.

ours fourth Flex-Plane finisher

Repeat orders Boom Sales of versatile Detroit Special

A LEADING Michigan contractor began the year by buying his fourth Flex-Plane Finishing Machine. Repeat order business has always been high at Flex-Plane. In fact, to our knowledge, no contractor who has once used the *Detroit Special* has purchased any other make.

There's a good reason. It's the MOST PORTABLE finishing machine built. It moves *fast* — both on the job and from job to job. Here's where the dollars are saved today, and here's where the Flex-Plane shines. It's the MOST ADJUSTABLE finishing machine built. Famous "Two-in-One" adjustability doubles the range of working widths of other makes. A single Detroit Special can replace two or more less adjustable machines. It does MORE WORK FOR YOU. It's a "do-all" machine that enables contractors to bid all jobs . . . city street, turnpike, airport, water basins . . . and do a real finishing job at greatly reduced costs.

What's more, the Flex-Plane Detroit Special is designed and built to exactly suit the contractor's specific needs. You tell us your special requirements and we'll build a Detroit Special that will cover them.

Compare! Talk to owners using the Special on every kind of work — patch jobs to super highways — the story's the same: *The Detroit Special is by far the world's finest finishing machine!*



THE FLEXIBLE ROAD JOINT MACHINE CO.

2500 THOMAS ROAD
WARREN, OHIO

GET ALL THE FACTS, NOW! The new, fully illustrated, 16-page factual Bulletin P-111 is just off the press. To get your copy write —

Please send additional data on the Detroit Special Finishing Machine.

Name _____

Company _____

Address _____

City _____ State _____

Increased Productivity With Tractor Attachments

■ A new booklet tells how contractors can increase productivity of new or used tractors by adding the right attachment. The brochure contains what are described as cost and time-saving ideas taken from

actual case studies. On-the-scene action photos show tractors with Hyster attachments working on a variety of construction operations.

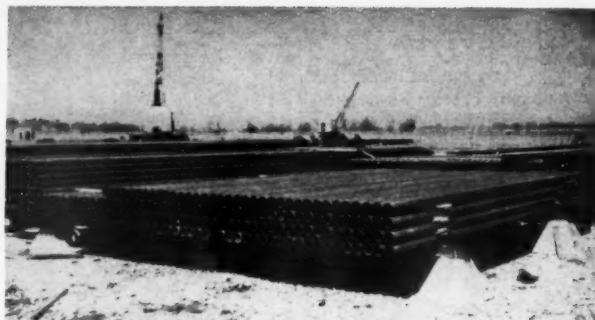
To obtain this literature write to the Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg., or use the Request Card at page 18. Circle No. 558.

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A DIVISION OF WARD'S NAME PLATES

Rail skids with precast-concrete supports are useful for general yard storage of heavy materials.

Skid for Yard Storage of Heavy Materials

■ To simplify yard storage of heavy materials such as steel pipe, tubing, and beams, the L. B. Foster Co., P. O. Box 1647, Pittsburgh 30, Pa.,

has developed a sturdy high-load-capacity skid that is easily moved from place to place.

The skid consists of railroad rail, cut to length, and precast-concrete supports with anchor bolts cast in place. To assemble the skid, the concrete supports are spaced at desired intervals, and then the rail is simply bolted to the supports and anchored with rail clips.

An important advantage of this skid is the fact that it is quickly disassembled, allowing it to be moved or its supports adjusted.

In addition to supplying the rails and rail clips, the L. B. Foster Co. will also furnish drawings and instruction sheets for casting the concrete supports and assembling the units.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 642.

Midwest Prestressing Holds PI Method Rights

A new firm, Midwest Prestressing, Inc., 928 Broadway, Kansas City, Mo., holds the license rights to the use of the PI method of prestressing concrete in its vicinity. The company, utilizing the resources of the Kansas City Bridge Co. and Long Construction Co., Kansas City, Mo., construction firms, will operate as a subcontractor on jobs requiring the prestressing of concrete beams, girders, and panels. A fixed price proposal and a performance bond, if required, will be given to contractors by the firm.

The company is headed by Lyle Cushing, who has been with the Kansas City Bridge Co. for the last 25 years. William E. Brown is vice president and Fred K. Shibley, treasurer. These officers, together with Robert W. Long, Marshall Long, Daniel C. Weary, and Robert M. Hoover, form the board of directors. Mrs. Phyllis Roof is secretary.

Ratchet-Lever Hoists

■ A bulletin on ratchet-lever hoists is available from the Coffing Hoist Co., 800 Water St., Danville, Ill. The literature describes the entire line of Coffing Safety-Pull ratchet-lever hoists, including both roller and coil-chain models, with capacities ranging from ¾ to 15 tons.

The bulletin illustrates the ratchet-pawl construction that eliminates friction brakes and the quick-disassembly feature of the coil-chain hoists.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 601.



30% to 40% faster drilling: D. C. Toye Company's 7500 cu. yd. foundation excavation for Willamette View Manor near Milwaukie, Oregon, included 3500 yds. of basalt rock. Blasts had to be kept small because of nearby hospital. 6' to 8' holes were drilled on 4' to 6' centers with a 55 lb. sinker. By using a Jaeger Model 125 compressor, instead of a 105, drilling was completed 30% to 40% faster.

80 yds. of rock per hour per drill: With 10 wagon drills, H. W. Holt & Son averaged 16,000 cu. yds. of rock excavation per 20-hour day on West Virginia Turnpike. A "600" compressor behind each pair of drills kept them at the required top speed. No excavating contractor, today, would buy a 500 ft. compressor for such work. The other "old standard" sizes of 60, 105, 160, 210 and 315 ft. are on the way out for similar reasons.



To power your tools at full efficiency

Jaeger gives you 15% to 25% more air

The difference between a "new standard" Jaeger and others is 15% to 25% more air for your money — 75 ft. instead of 60, 125 ft. instead of 105, and larger sizes comparable.

On the job that additional air often means full pressure instead of mere 70 lbs. pressure at the tools, directly increasing work output 30% to 40%.

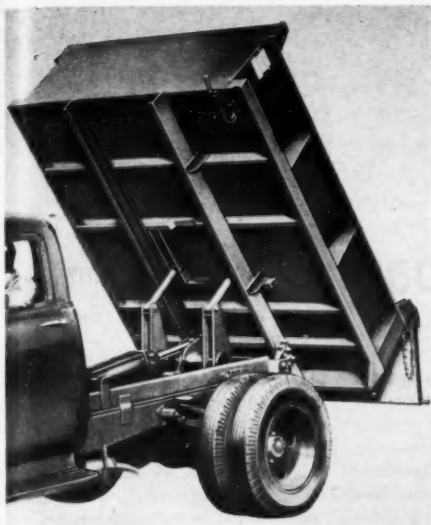
Jaeger "Air Plus" compressors have been delivering these higher volumes for years, at moderate temperatures, with notably low fuel consumption, and we believe, the lowest cost of upkeep of any compressors.

Now, when cost-savings are so important, ask your Jaeger distributor to show what he can save you on air and air tool operation — or send for Catalog JC-1.

THE JAEGER MACHINE COMPANY

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The Wayne Division of Gar Wood Industries has introduced a new line of hoists and dump bodies.

Line of Dump Bodies And Arm-Type Hoists

■ A new line of arm-type hoists and matching dump bodies has been announced by Gar Wood Industries, Inc., 36253 Michigan Ave., Wayne, Mich. The Gar Wood Strong-Arm hoists, with their improvements, are reported to have more lifting capacity and longer hoist life. They also feature easier maintenance without the need for special tools or hydraulic specialists. Tapered cylinder heads on the hoists permit low mounting, and the hoists have an advance lifting point to reduce strains. Dumping angle is 55 degrees.

A tubular torque tube is integrally welded to the lift arms to prevent strain on one side, even on rough ground. The hoist cylinders are of three-piece construction—head, tube, and base—held together by a tie-rod assembly. Each individual cylinder part may be removed or replaced to make maintenance easier and to reduce parts costs.

The hoist pump is a Gar Wood three-piece laminated unit, with wear plates that can be replaced in the field without difficult hand fitting, shims, or gaskets. A direct pump-to-cylinder hose connection allows the pump to be connected to the power takeoff with a straight short drive on any chassis.

The new Gar Wood standard-duty bodies will be known as the GA series. Included in the series are a contractors' body and combination dump and platform bodies. The contractors' body is constructed with a shell of 10-gage steel. Heavy structural-steel longitudinal and cross channels, as well as side V braces, tend to increase body life. A rigid Z-member rear apron extends the width of the body and the depth of the longitudinals. Heavy, full-boxed tailgate construction provides rigidity. Full-length running boards are provided.

Optional features include cab protectors, flared sides, hinged steel extension sides, steel swing partitions, slots for wood partitions, corner baffles, a door and chute with deflector, a split barn-door tailgate hinged at the sides, rubber gasket for a watertight tailgate, wheel housings, bag and rope hooks, and access steps.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 546.

International Harvester Announces Promotions

Personnel changes in the motor truck division of International Harvester Co., Chicago, Ill., include the appointment of John J. Carter as comptroller. Mr. Carter fills the vacancy created by the death of G. D.

Wade. The new comptroller joined the company's Wichita, Kans., district office in 1927. He has been assistant to the divisional controller.

Other appointments in the division include that of T. E. Aughinbaugh as assistant sales manager in the southern region. He was formerly an assistant district sales manager.

Power Plants Speed Construction USE POWER TOOLS—FLOOD LIGHTS

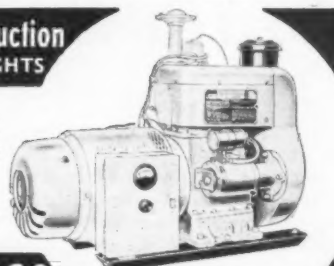
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MANSFIELD, LOUISIANA

So You Want to Get a Construction Loan?

By C. TRIEB SLOTE

RECENT CHANGES in the profit-margin picture are sending more and more contractors to banks for construction loans. Not only are these margins lower as a result of increased production capacity in the building industry (competition is just that much tougher), but also

profits are being cut further by the ascendancy of the home buyer, who is now in a position to demand many more extras at no increase in price over last year.

It seems important, then, that contractors know the procedures involved in securing loans and—per-

haps more important—the requirements they may be expected to meet before such a loan is granted.

Getting any bank loan is never a mechanical process involving so many stereotyped steps, and construction loans are in a special class by themselves. For one thing, these

loans usually depend more on such intangibles as reputation, past history, and judgment than do loans to industries where inventories are a major factor. Construction loans also cost more, for banks must bear the expense of field checking. Moreover, because so much money may be tied up in guarantees and withheld percentages, builders are not usually able to maintain substantial balances in their accounts as borrowers are often required to do.

What makes for a successful loan application? To answer this question satisfactorily, you must put yourself in the banker's chair and appraise yourself through his eyes. It is well to begin with this general rule: banks do not take heavy risks. Bankers try to operate on the principle of stewardship where their depositors' money is concerned; hence, they lend only where the need is temporary and repayment is reasonably assured.

Good Judgment

In large cities, banks have loan officers who specialize in construction accounts. These men know industry conditions, and their judgment is based on experience. In smaller communities, the banker may not be familiar with construction as such, but he knows his depositors and his area.

In any case, however, the same yardstick is used in determining the advisability of a loan. For example, where a contractor who builds for another is concerned, a cost-plus contract is probably as good a basis for a loan application as you can come up with. A lump-sum contract bid in open competition may or may not be acceptable. If the bid was unusually low, the banker will want assurance that the work will not be done at such a loss that repayment is placed in jeopardy.

In the case of the speculative builder, the bank must rely even more heavily on its own judgment—and on the builder's reputation. One banker recently characterized the typical builder as "a congenital optimist with what he believes to be a God-given right to build, regardless of need". It is up to the

HERE'S HOW YOU SAVE WITH FORD TRIPLE ECONOMY

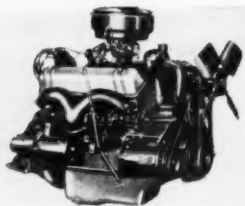
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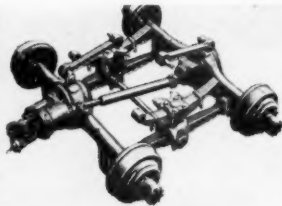
In every Ford Truck you'll find a new gas-saving, Low-FRICTION engine. For greater driving ease, there's Ford's famous Driverized Cab. And every Ford has strong, low-weight chassis for money-saving load capacity. For complete information, see your Ford Dealer today! Or write: Ford Division, Ford Motor Co., Dept. T-10, Box 658, Dearborn, Michigan.



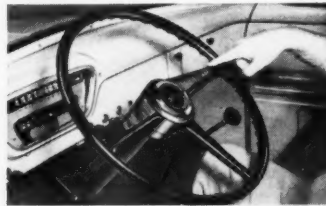
Brand new Ford factory-built T-800 Tandem-Axle Big Job is rated for 40,000 lbs. GVW, 60,000 lbs. GCW—gives you up to 3800 lbs. more payload than other make 6-wheelers in this class. Powered by the new 170-h.p. Cargo King V-8.



New Low-Friction 170-h.p. Cargo King V-8 gives you up to 41% more power per cubic inch than other truck engines in its class.



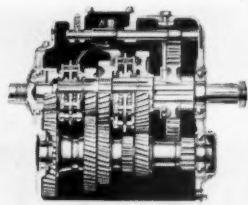
Latest design tandem axle bogie features rubber-bushed suspension and power divider with 3rd differential lockout.



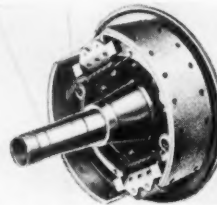
New Master-Guide Power Steering is standard on T-800. Operative at all times, it cuts steering effort as much as 75%.



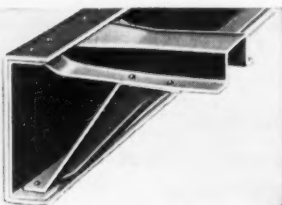
Driverized Cab has big, one-piece windshield, free-breathing woven plastic upholstery, exclusive seat shock absorbers.



Heavy duty, 5-speed Synchro-Silent transmission is available in direct or overdrive. Auxiliary transmissions also available.



New T-Series has vacuum-power operated hydraulic brakes on all six wheels. Full air brakes available on the T-800.



Deep, double channel frame has parallel side rails 9 1/4 in. deep. Reinforced from rear of front spring to end of frame.



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CONTRACTORS AND ENGINEERS

Here are the things bankers need to know about a contractor and his business before they can agree to advance funds

bank to determine the merit of enterprises on which it is asked to make loans. Sometimes the bank's findings will not only save its depositors' money, but prevent catastrophe for the contractor as well.

In speculative building, the bank will probably want a commitment from a long-term lender such as a savings bank or insurance company. The bank will also study closely any qualifications in such a commitment before it grants the loan. Banks almost always require that the builder be able to pay for land-development costs out of his own capital so as to reduce the risk of the mortgage lender.

In appraising your loan application, particularly for speculative building, the banker must first be convinced that you are a reputable contractor. If he does not already know you, he will seek information from subcontractors, architects, union officials, clients, and others with whom you have had business contact. Your record of debt repayment will also influence the decision.

Traditionally, the banker's fundamental gage for measuring loan advisability has been made up of these five C's: character, capacity, capital, collateral, and conditions.

Character and capacity apply to you, the management. In no other business, perhaps, are these elements so important as they are in construction, where the very nature of the industry permits so many shoestring operators to function alongside the giants. Moreover, since speculative building is so much a matter of judgment, the personal factor looms very large indeed.

Capital comes next—assuming the personal elements are satisfactory. Inexperienced builders sometimes expect the bank to supply the lion's share of the company's financial backing. A contractor should be prepared to demonstrate his own confidence in his business by investing an amount in reasonable proportion to his debt. Of course, what is reasonable will vary with individual cases.

Collateral, bankers say, does not make a bad loan good, but it may make a good loan better. Bankers

do not like to foreclose, particularly in cases where they might find themselves with half a foundation and a pile of bricks on their hands. Conditions, the last of the measuring points, will be the aspects of the general business picture which affect

(Continued on next page)



It's wise to have a certified public accountant check the financial health of your business before you apply for your loan.



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Some Breeds Dig Better

It takes years . . . of hard work, practical experience and painstaking effort to develop a thoroughbred "breed" . . . but the results are worth it! When you call on a thoroughbred he gives you all the power, speed and stamina in him, without urging.

For over a hundred years . . . since 1852 Osgood has been developing and improving a thoroughbred "line" of power cranes and excavators, studying the requirements of various type jobs and engineering new machines or improvements to fulfill these needs. OSGOOD-GENERAL machines will respond with a steady smoothness to an operator's demand . . . and they are rugged, with plenty of stamina for long continuous service.



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You should be prepared to produce an itemized financial statement when applying for a construction loan.

(Continued from preceding page)

the tightness or easiness of credit, as well as those circumstances in your industry or locality which affect your financial prospects.

Vital Statistics

Naturally, the bank will also want some concrete evidence of your business solvency, and it won't be satisfied with round figures taken from your memory. Most banks will request these statements:

1. Comparative balance sheets for several years, showing your assets, liabilities, and details of capital.

2. Comparative profit - and - loss statement (also called income statement) showing the results of operations over a period of time. It should include such items as salaries, rent, depreciation, supplies, and expenses, as well as gross margins and net earnings.

Along with a request for the two financial statements, you are likely to be confronted with questions about everything from your tax reserve (Is it adequate?) to your break-even point (What is it, and how do you compute it?).

An excellent pamphlet, "Financial Statements for Bank Credit Purposes", outlines briefly the main elements in which banks are interested. It is published by Robert Morris Associates (the national organization of bank loan officers and credit men), 1417 Sansom St., Philadelphia 2, Pa. Your bank will obtain a copy for you.

The contractor who has had the services of a certified public accountant over the years is in a position to facilitate processing of his loan. His information is already in order, and the figures come from the professional the bank respects in these matters. Even the contractor who has not employed a public accountant regularly would be wise to consult one before applying for bank credit. He can thus get some idea of where he stands, and if difficulties are discovered, they can be remedied before formal application for the loan is made.

Basic Difficulties

Any one of a number of conditions will make banks suspicious of an applicant's business acumen. These examples will illustrate two mistakes the contractor may make.

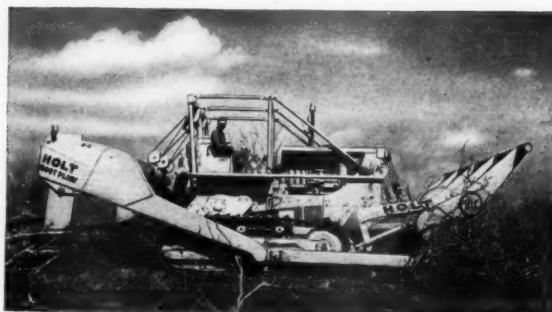
Contractor Smith bid and got a public school job, expecting to let out the concrete and brick work to a subcontractor. When the time came, however, the subs were all busy on other jobs. This meant Smith would have to do the work himself, and it meant investment in equipment and materials, not to mention a payroll. The contractor was forced to make a frantic last-minute appeal for a bank loan. Had he planned his finances ahead, Smith would have been better prepared to take the alternate course when his gamble on subcontractors failed.

An eastern banker advanced this reason for refusing to go along with a 100-dwelling project proposed by Contractor Doakes. "You don't have enough of your own capital to build 100 units at once," the banker said. "But we'll back you up for 25 units at a time." The builder agreed. But when the bank field man visited the construction site, he found all 100 units going up at once. The builder had raised money for the other 75 elsewhere. The banker avows he'll never extend credit to the contractor again. Not only was his conduct unethical, but the contractor had far overextended himself financially, thereby changing the complexion of the original loan.

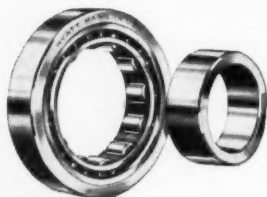
The bank will place greater reliance on your financial statements if they have been audited by an independent certified public accountant. For unsecured loans of \$10,000 and up, such an audit is usually a prerequisite. The auditor's report—containing your financial statements



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THEY
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the greater the need for HYATT BEARINGS!



Not an atomic tank, but a "king-sized Cat"—used to clear mesquite from Texas ranches. Built by the Peterson Tractor & Equipment Company, of San Leandro, California, the giant tractor pictured above is actually two Caterpillar D-8's joined together—each with the inner track and driving mechanism removed. And in the new final drives—necessary because of increased ground clearance—the builders naturally used Hyatt Roller Bearings, the same precision bearings as those used throughout the standard tractors. As always, Hyatts were specified because they can be counted on to hold maintenance costs to a minimum while reducing friction and wear.

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ROLLER BEARINGS

CONTRACTORS AND ENGINEERS



and the accountant's opinion of them—may be submitted in either short or long form.

Whatever the form of the audit, the scope should be as wide as necessary. An unrestricted audit is necessary for an unqualified opinion. If you limit the accountant's investigation, he'll have to mention the fact in his report. The bank may not be too favorably impressed with this qualification.

The cost of a suitable audit should be regarded as a basic business expense. The audit may also help you in laying out plans for repayment of your loan.

Healthy Ratios

Banks sometimes employ ratios as a rough estimate of your financial position, usually to fortify impressions derived from other sources. While there is no fixed law regarding these ratios, they may help you to size up your situation from the bank's point of view. Here are some good averages:

Current ratio—current assets divided by current liabilities; should usually be at least 2 to 1.

Quick assets to current debt—cash, receivables, and other ready cash items divided by current debt; should usually be at least 1 to 1.

Debt to capital—creditors' money compared to owners' money in the business; the lower the ratio the better.

Fixed assets to capital—real estate, machinery, equipment, and fixtures divided by net assets; ratio should be as low as possible to avoid depleting working capital.

Inventory to working capital—shows percentage of working capital tied up in inventory; abnormally high ratio may result in shortage of liquid working capital to meet other expenses. (In the case of contractors, guarantees and withheld percentages would replace inventory.)

In conclusion, it seems hardly necessary to stress the point that borrowers should cooperate with banks—yet bankers say the point needs to be emphasized. Applicants will sometimes give information grudgingly and throw hurdles in the banker's way. There is no reason to hold back information which the bank needs for its decision on your loan; the result may be delay or loss of your loan. Information received from all applicants will be kept confidential.

THE END

This article was prepared with the cooperation of the American Institute of Accountants, the national professional society of certified public accountants.

JUNE, 1954

Resistance Strain Gages Are Treated in New Book

Some of the latest results of the studies of resistance strain gages are presented in "Characteristics and Applications of Resistance Strain Gages", National Bureau of Standards Circular 528. The eleven papers presented in this volume cover new work in progress on strain gages, on special temperature compensated gages, on gages for strain measurements beyond the elastic range, and on the application of strain gages to the determination of dynamic properties of materials.

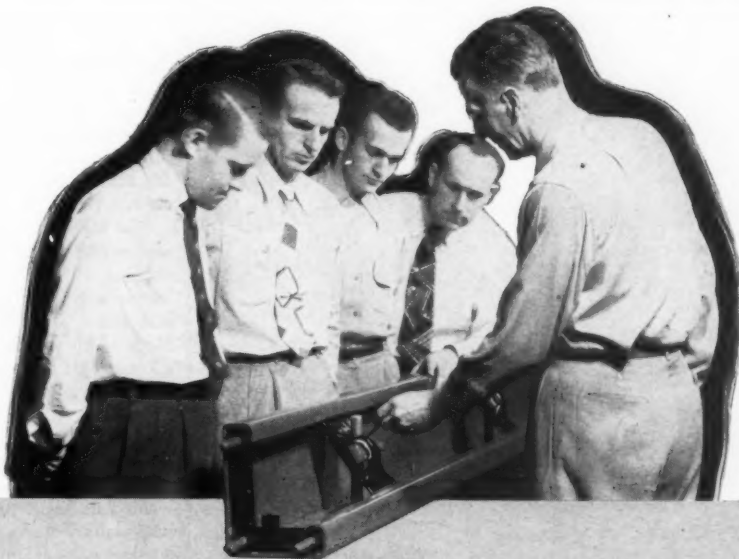
A comparatively new tool in the study of materials and structures, strain gages have been used to measure mechanical qualities such as acceleration, impact force, and dynamic pressure, and these applica-

tions are also covered in the book. Priced at \$1.50, the book can be ordered from the Government Printing Office, Washington 25, D. C.

Cutcrete and Joint Sawing Merge in Lewis Enterprise

Hurst Lewis, president of Hurst Lewis Enterprises, Pasadena, Calif., has announced the merging of Cutcrete Corp., and Joint Sawing, Inc., within the corporate structure of the Lewis organization.

The Joint Sawing Division will continue to manufacture and lease the multiple-blade saws for sawing weakened plane or contraction joints in all types of concrete pavement. Cutcrete Corp., manufacturer of Cutcrete saws, will remain a separate division of the parent organization.



THE LATEST DEVELOPMENTS IN HIGHWAY AND AIRPORT FORMS

● All paving forms should perform two distinct functions. First, they should accurately confine the limits of the pour, and, secondly, they must act as track, supporting and steering the massive machinery required to prepare the subgrade, spread, finish and cure the slab.

● The ability of Heltzel Forms to best fulfill these two basic functions is the big reason why they are preferred by leading contractors everywhere. For behind the Heltzel name is almost half-a-century leadership in the design and manufacture of steel forms. This "know-how"—has enabled Heltzel to constantly produce practical, workable, "form setter's" forms that set fast, align perfectly, hold steady and firm. And "Heltzel Built" means they're precision fabricated of special analysis carbon-manganese steel, pre-stressed to

withstand heaviest loads without failure.

● The form illustrated above is the latest design of the popular HELTZEL DUAL-DUTY FORM. (Two forms in one for two different slab thicknesses.) It features extra-wide, two-way stake pockets and restyled end supports which add up to the strongest form in the field. The triple-prong slide locking arrangement and single direction wedging gives form setters perfect alignment with a minimum of effort.

● This long experience and constant experimentation make it just common sense to see the Heltzel representative in your area before you purchase form equipment. If you don't already have a complete file of Heltzel Form literature, use the coupon below.

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Booklet on Backfiller

■ The new Cleveland Model 190 backfiller, a heavy-duty machine for use on pipeline work and similar heavy-construction projects, is the subject of a new bulletin.

The text stresses the backfiller's one-man operation, 7-foot backfill

board, balanced traction, and continuous operation while traveling. Complete dimensional drawings and specifications are given.

To obtain this literature write to the Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 607.

Maintain Equipment at Less Cost . . . with the Air Master COMPRESSOR

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2 Thurman Portable Truck Scale ready for transporting.

3 Mr. Olstad and Al Jensen about to re-assemble scale just after arrival at site.

4 Weighing trucks all in 1 3/4 hours. Proof of Thurman portability.

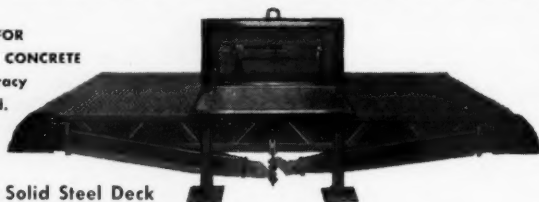
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PORTABLE TRUCK SCALE

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PITS. Accuracy
Guaranteed.



Balanced Solid Steel Deck

ENGINEERED TO TAKE IT! The photo report above is proof of Thurman on the job portability and rugged precision. The solid steel deck is perfectly balanced and rests on bearings which absorb the shock of moving vehicles. The weighbeam is chrome-plated and all vital parts are electro-plated against weathering.

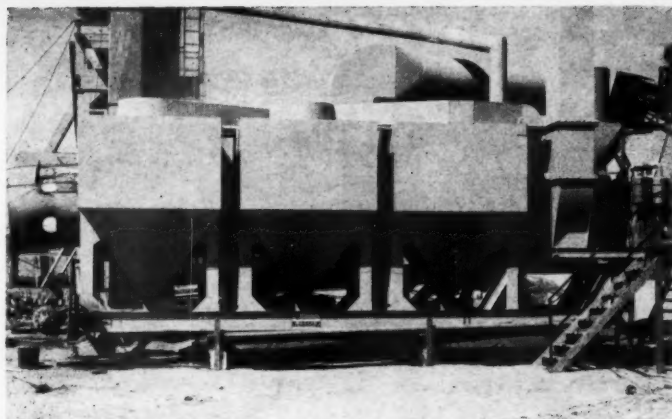
NO PIT IS EVER NEEDED! Your scale is ready in minutes on any flat terrain. Gravel or earth will serve as a ramp. To move, just take out 6 bolts which hold side arms in place. The complete scale can then be lifted as a unit and loaded onto a truck.

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THURMAN MACHINE CO.

(SCALE DIVISION)
156 N. 5th Street, Columbus, Ohio
Est. 1918 Dept. A



The Madsen No. 380 dust collector.

Square Dust Collectors for Asphalt Plants Are Easy to Repair and Maintain

■ A new line of portable dust collectors is announced by Madsen Iron Works, Inc., P. O. Box 38, La Mirada, Calif. Designed for all sizes of asphalt plants, both batch and continuous type, these dust collectors are available with one, two, and three-cyclone units for plants ranging from 1,000 to 4,000 pounds in capacity.

The Madsen dust collector units are mounted on a base frame of suitable width to receive a standard trailer axle, vacuum or air brakes, and pneumatic-tired wheels. The Models 280 and 380 collectors have goosenecked front ends for transport by a truck-tractor or a dolly with a drawbar. Contained on the basic trailer frame are the cyclone units with their tipping valves, gathering-screw conveyor, suction manifold welded in place, turret-type outlets with square ducts extending to the suction side of the exhauster, and the exhauster.

One of the special features of the Madsen units is the On-The-Square design. Approximately 90 per cent of the surface, including the cyclone units, air ducts, and piping, can be

replaced with flat steel plate when repair and maintenance work is necessary. The cyclone units have interior circular plates which contribute to the cyclonic action and provide labyrinth trapping of dust particles. The 8-foot cyclone units are spaced 12 inches apart to provide easy access to the adjacent sides for maintenance work. The duct work is arranged in parallel so that each cyclone receives a proportionate share of the air-volume load.

The manufacturer points out that the square cyclones used in the collectors are lower in over-all height than the conventional cylindrical units. This makes repairing, maintaining, and transporting easier.

Three sizes of exhausters are available for use with these dust-collector units. While the collectors may be operated with or without an added wet scrubber unit, the Madsen Triple Wet Tube dust washer may be used for dust abatement and air washing of the dryer exhaust to meet air pollution requirements.

For further information write to the company, or use the Request Card at page 18. Circle No. 565.

Servicised Premolded Para-Plastic* for Effective, Low Cost JOINT SEALING

TWO TYPES:

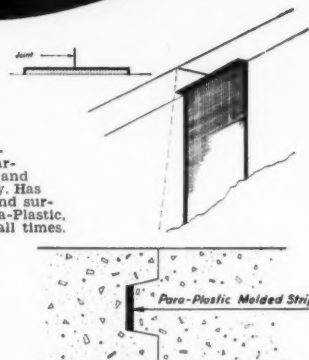
1. PARALATERAL Wide Strip

For sealing vertical construction or expansion joints in Retaining Walls, Abutments, Wing Walls, Foundations, etc., particularly when one side will be backfilled and protection from water seepage is necessary. Has rigid backing of asphalt joint material and surface and both edges coated with Para-Plastic, which maintains bond with concrete at all times.

2. MOLDED STRIP

Para-Plastic Sealing Compound is molded into strips for sealing keyed construction joints and cracks or breaks in vertical concrete surfaces. Concrete poured against the strip, after setting up, will bond with strip to form watertight seal.

Write for complete details on Servicised Products for the construction industry. See our Catalog in Sweet's.



*Para-Plastic is one of the many Patented products developed by Servicised Products Corp. for the construction industry.

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CONTRACTORS AND ENGINEERS



The new G&T Versi-Pressor compressor operates off an ordinary vehicle battery.

Pump and Compressor Are Battery-Operated

A portable fluid pump and a portable air compressor are two new products announced by G & T Industries, Inc., 1420 Barwise, Wichita 2, Kans. Both of these units are driven by any standard 6 or 12-volt vehicle battery.

The G & T Versi-Pump has a capacity of 750 gph and is particularly suited for emergency drainage, hydra-inflation of heavy tires, and for fueling trucks, tractors, and other equipment in the field. The unit weighs 30 pounds and has a carrying handle and a handy rest.

The G & T Versi-Pressor will inflate a 6.00 x 16 tire to 30 pounds air pressure in 30 seconds or a 7.50 x 20 tire to 55 pounds in 3½ minutes. It develops a vacuum of 24 inches of mercury. The portable compressor also provides pressure for greasing and similar work.

For further information write to the company, or use the Request Card at page 18. Circle No. 567.

Galion Sales Manager

Directing sales of Galion Allsteel dump bodies and hoists and Galion Load-elevator rear-end loaders in the southwest is Edward R. Curry, the company's new regional sales manager. Mr. Curry, who will make his headquarters in Tulsa, Okla., was formerly a district sales manager for the St. Paul Hydraulic Hoist Division of Gar Wood Industries, Inc.



NEWCO* WIRE ROPE CLAMP & THIMBLE

- ... gives holding efficiency of 95 to 100%.
- ... will not collapse.
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BEARING SERVICE is many times heavier; for example, the ¾" Newco has a ½" bearing surface! Carries a heavier load, and the original cost is easily absorbed by savings on labor and longer life. In 12 sizes.

¾" to 1" size STEEL CLAMPS (Approx. 80,000 PSI's)
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Publish Reference Book On Metals and Welding

Information on designing and making better welds at lower cost is contained in a combination text and reference book, "Metals and How to Weld Them", published by The James F. Lincoln Arc Welding Foundation.

The first part of the book is devoted to an elementary discussion of metals, their mechanical and physical properties, and their uses. This basic information is related to correct welding procedures for steels, cast iron, nonferrous materials, and hardsurfacing. Discussions of trouble shooting and cost estimating, as well as an explanation of welding terms, are contained in the final section.

The book, written by T. B. Jefferson, editor of *The Welding Engineer*,

and Gorham Woods, contains 322 pages and more than 170 drawings, photographs, and tables. Copies are

\$2 in the United States and \$2.50 elsewhere, and may be ordered from the publisher, Cleveland 17, Ohio.



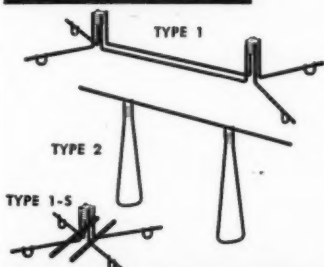
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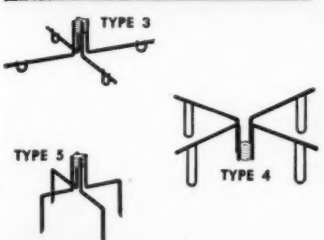
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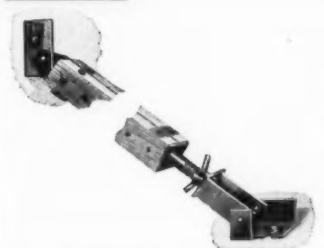
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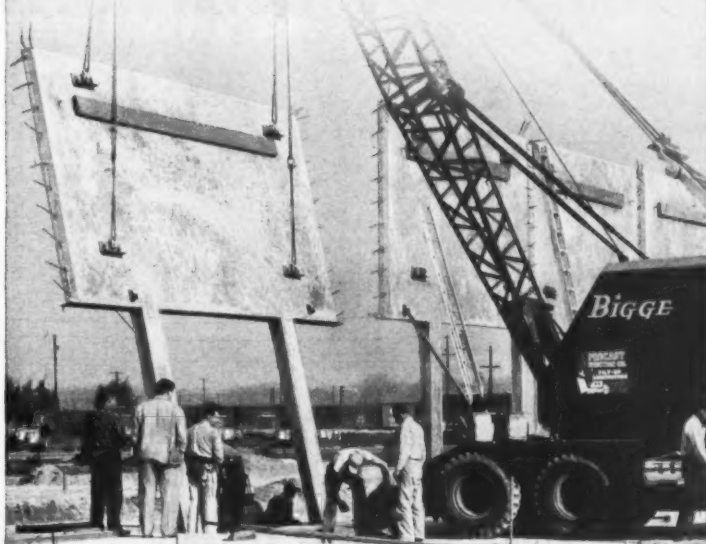


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Our recommendations will be given without charge or obligation on receipt of a set of plans.

TILT-UP ACCESSORIES Complete Engineering!



42,000 LB. PANEL being raised into position at United Grocers Warehouse, Fresno, Calif. Concrete panels are 8-inches thick with 12-ft. legs. SUPERIOR Pick-Up Inserts, Brace Anchors, and Braces were used. The exclusive pivoting action of the adjustable Braces permitted quick positioning and alignment of the panels. Contractor: Precast Erection Company, Niles, California.

Tilt—Lift—Position!—The proper type of Pick-Up Inserts and Brace Anchors and their location in the slab or precast structural member is of prime importance in order to withstand the stresses occurring when tilting, lifting, and positioning.

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The many types of SUPERIOR Inserts, Anchors, and Braces for every job condition together with complete engineering service provide a combination which offers safe and efficient handling of any precast panel or structural member.

For details request a copy of Bulletin TU-2.

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Foster Consultant Named

Professor Charles O. Gunther is serving as a research consultant for the L. B. Foster Co., Pittsburgh, Pa., supplier of steel sheet piling. A

member of the American Society of Civil Engineers, American Society of Mechanical Engineers, and Society of American Military Engineers, he has held various teaching posts at Stevens Institute of Technology.

SAVE hours every day—
days every month... with

MILLER Tilt-Top
2 minute
loading!



MODEL "B" 10 TON \$1175.*

The following equipment is optional and extra: hydraulic tilt control, two-speed winch, electric brakes.

* Plus freight and Federal Tax.

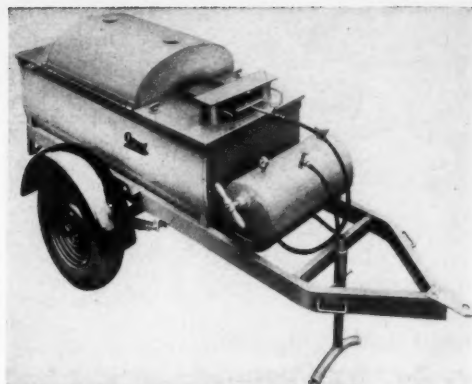
Time saved between every job means time added on the job. MILLER Tilt-Top's quick tilt loading enables ONE man to load or unload in less than two minutes... spend the extra time gained in profit-making operations on the next job. With its better maneuverability, easier backing, fast trailing and quick loading—MILLER Tilt-Top's the ideal extra trailer for extra production. Standard oak platform is 14' x 8', optional 16' available.

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research engineers



456 S. 92nd Street, Milwaukee, Wis.



Operator fatigue is reduced as a result of the low mounting of the new Aeroil Lo-Load Heet-Master asphalt kettle.

New Asphalt Kettle Has Low Mounting

■ A lower mounting that increases operating efficiency is the chief feature of a new asphalt kettle intro-

duced by the Aeroil Products Co., Inc., 75 Wesley St., South Hackensack, N. J. The 1954 version of the Aeroil Heet-Master kettle is reported to be 10 inches lower than some similar kettles. The lower center of gravity and the semielliptical springs of the Lo-Load design make for stability and safer trailing.

The improved kettle also has the company's Heat Riser feature which is said to make for faster heating. A 2½-inch poppet-type cock makes it possible to draw off larger volumes of heated asphalt quickly.

Safety features include an inverted-Y-type front drop leg and a rear drop leg which is located diagonally across from the pump to prevent tipping. Stack insulators and vented kettle covers that open easily are other design advantages. The kettle is available mounted on either pneumatic tires or skids.

For further information write to the company, or use the Request Card at page 18. Circle No. 621.

Uses of Electric Plants

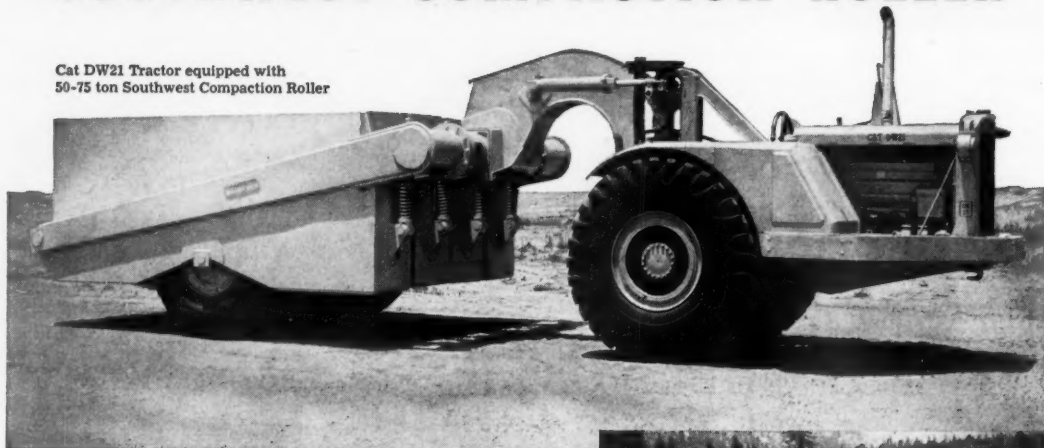
■ How Onan electric generating plants are used in many different applications is told in Volume 10, No. 2, of the company's publication, "Power Points Digest".

Featured is the unusual floating concrete plant used in building pier foundations for the new Tappan Zee Bridge which spans the Hudson River between South Nyack and Tarrytown, N. Y. How the Onan 5-KW electric plant provides power for the motors that drive the cement batcher and the cement bin signals, batching meters, and the ship-to-shore radio telephone is told in detail.

To obtain this literature write to D. W. Onan & Sons Inc., University Ave. S. E., Minneapolis, Minn., or use the Request Card at page 18. Circle No. 584.

NEW COMPACTION RECORDS SET BY SOUTHWEST COMPACTION ROLLER

Cat DW21 Tractor equipped with
50-75 ton Southwest Compaction Roller



with Caterpillar Diesel Tractors

USING FEWER PASSES over heavier lifts the Southwest Compaction Roller is setting new records on every job. On the bigger jobs the combination of the Southwest Roller and Cat DW21 keeps pace with 24-hour job schedules and the largest earth moving equipment. With the extra flexibility of the exclusive Southwest independently oscillating weight-box units, you get uniform compaction weight on each tire regardless of ground contour. And there is no bridging, no shifting of load.

To suit varying job requirements the hauling yoke is sectionalized for adding or subtracting weight boxes... the yoke is also flanged to permit changing the draft beam assembly... and the weight boxes can be filled with any material to obtain desired total weight. Sizes and capacities range from 10 to 100 tons. Write for compaction data covering various types of soil and for illustrated literature.



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CONTRACTORS AND ENGINEERS



The Lug-All winch hoist is now offered in a rust-resistant model.

Portable Winch Hoist Is Corrosion-Proof

■ The ratchet-operated Lug-All winch hoist is now available in a new model for use under conditions where rust and corrosion normally shorten the life of hoists and other metal tools. The new Marine model has a 133-strand stainless steel pre-formed aircraft cable. The frame is of aluminum alloy, and all aluminum parts are anodized.

The Lug-All Marine weighs only 8¾ pounds, yet lifts, lowers, or pulls 1½ tons. When used with a single cable, it lifts, lowers, or pulls ¾ of a ton a distance of 10 feet.

Other features of this device include oiled-for-life bearings and a reversible handle that may be removed quickly to provide a tamper-proof load binder. The handle will bend if dangerously overloaded, thus preventing damage to the hoist and possible injury to the user.

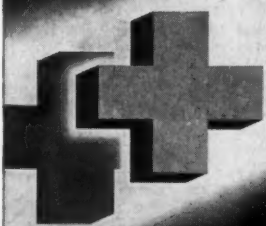
The winch hoist can be operated forward, reverse, or free-wheeling. Double interlocking pawls hold the load, and there are no brakes to slip. The unit comes complete with three swivel hooks and a built-in pulley block, which enables the user to work around corners and in as little as 10 inches headroom.

For further information write to the Lug-All Co., 331 E. Lancaster Ave., Wynnewood 2, Pa., or use the Request Card at page 18. Circle No. 641.

Perfection Salesman

John A. Record, a former Gar Wood representative, has been appointed north-central sales representative for the Perfection Steel Body Co., Galion, Ohio. Mr. Record will make his headquarters in St. Paul, Minn.

answer the call



join and serve

Lead Melting Furnaces

■ A new line of heavy-duty portable lead-melting furnaces for use with liquefied petroleum gas, propane, butane, or bottled gas has been placed on the market by the Hauck Mfg. Co., 126 Tenth St., Brooklyn 15, N. Y.

The line includes wheel-mounted models of 200, 450, and 700-pound capacity. Leg-type units are made in 125, 200, and 450-pound models. These furnaces are claimed by the manufacturer to melt 200 pounds of lead to pouring temperature in 10 minutes. An entirely new size, suitable for hand carrying, is the Model No. 66 Red Dot furnace, claimed to melt 50 pounds of lead in 9 minutes.

The furnaces are recommended for pipeline jobs where the furnace must be moved as the job progresses.

Wheel models are easily moved by one man, even when the burner is in operation. All models, with the exception of the Red Dot, can also be supplied for use with kerosene fuel.

For further information write to the company, or use the Request Card at page 18. Circle No. 620.

CMC Names Representative

Edward R. Daley is the new west coast representative of Construction Machinery Co., Waterloo, Iowa. Mr. Daley, who works with CMC distributors in seven western states, makes his headquarters in Burlingame, Calif.



Fleet of SWENSON-Equipped Trucks Speed Blacktop Jobs
Contractors save money with Swenson Spreaders. Write for information. Swenson Spreader & Mfg. Co. Lindenwood, Illinois

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The Vibro-Tamper gives you better construction, new compaction speeds, greater efficiencies that afford important cost advantages. You can lay and compact a complete fully-keyed single course from 12" to 9" to over 95 Proctor in as little as *one* pass with the VIBRO-TAMPER. The same vibrating-tamping action runs in fines to the full depth. You eliminate backtracking, stockpiling and cut handling costs to a new low.

Ruggedly built for heavy duty road building. Simple controls, fool-proof and easy-to-use, eliminate need for assigned operators.

Vibration compacts stone without fracturing. Vibrating forces move stone to most compatible position for dense base.

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Gateway Tunnel Is Started for Weber Basin Project



Overlooking the valley at the mouth of Weber Canyon, Utah, is the yard of the Utah Construction Co. Nearby is the portal of Gateway Tunnel, part of the USBR's Weber Basin Project.

Excavation work on 3.3-mile conduit is done fast as \$71,000,000 reclamation program gets under way

By RAY DAY

IN A REGION where the adequate supply of water has been a problem for more than 100 years, an ambitious reclamation project is being started by the Utah Construction Co. of Salt Lake City and the U. S. Bureau of Reclamation. They are handling construction of the 3.3-mile Gateway Tunnel, one of the important structures in the Weber Basin project, which is being built at the mouth of Weber Canyon near Ogden, Utah.

The entire project includes a series of dams and reservoirs on the Weber River and its tributaries, a canal system for water delivery, various storage reservoirs, and two pump

stations. When completed, the project will put virtually all the water in the stream to productive use.

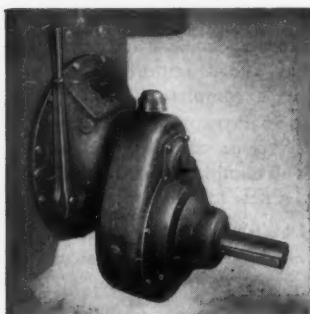
At present, about 350,000 acre-feet of water from the Weber River is wasted annually into Great Salt Lake. An additional 27,000 acre-feet of recoverable ground water remains unused, and about half the available land in the Basin is waterlogged.

The Weber Basin program, aimed at developing practically all of these unused surface and ground water supplies, will provide an average of 270,000 acre-feet of water annually for the region. Of this, 165,000 acre-feet will be used to irrigate 75,000 acres, including about 50,000 acres now without a supply of water. About 49,000 acres will be reclaimed by drainage. Municipalities and industry will have 40,000 acre-feet of water, and waterfowl refuges, about 65,000 acre-feet. Damaging floods on the Weber River, like the one of 1952, will be prevented. And the new reservoir areas will have recreational facilities planned by the National Park Service and the U. S. Forest Service.

Work Moving Fast

The contract for Gateway Tunnel, part of one main canal, covers all excavation and concrete lining work. If construction on this phase of the project continues at its current rapid pace, the tunnel may well be finished a year ahead of time. Excavation work was awarded December 10, 1952, and is now nearly completed. Project officials estimate that the concrete lining job should be finished by December.

The tunnel itself is a tangent-



FUNK PRODUCTS INCLUDE:

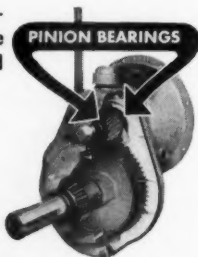
Right-Angle Take-Offs.
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Jack Shaft Extensions.
Ford Tractor Conversion Kit adapts 6 Cyl. Ford engine, doubles power. (See picture below.)



Here is a Golden Jubilee Ford Tractor converted with Funk NC Kit, other kits for any Ford Tractor.

FUNK GEAR REDUCTION POWER TAKE-OFFS FOR INDUSTRY AND AGRICULTURE

with the exclusive Straddle Mounted Pinion . . .



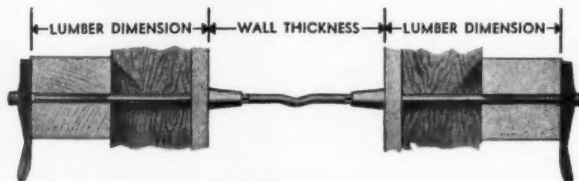
This exclusive Funk development assures complete gear tooth contact at all times by providing a pinion with a taper roller bearing support at each end driven by an input shaft with a lubricated floating spline, eliminating misalignment from improper installation or load deflection . . . some of the many reasons why you can expect longer, trouble-free service from FUNK Gear Reductions. Fit all SAE flywheel housings. Special ratios or special adaptations of standard units supplied on small orders. For keeping old equipment on the job economically, write for catalog and prices of Funk Power Take-Offs and Gear Reductions.



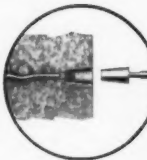
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Outer Unit will fit standard wedges; may be reattached to secure scaffolding, or to eliminate offsets at construction joints.

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CONTRACTORS AND ENGINEERS

Ingersoll-Rand DA-35 drills sink powder holes into the tunnel face. Three machines work from the single deck of the jumbo, and two others from the tunnel floor.

Blasted rock is removed from the tunnel by an Eimco mucker. The rock is loaded into muck cars and hauled from the tunnel on a narrow-gage track.

aligned bore with a straight and relatively flat grade, having a 1-foot drop per 1,000 feet. Located at elevation 4900, the bore passes under a high mountain ridge. Here, the highest elevation is 6025 feet, and the shallowest part of the overburden is at elevation 5225 feet.

Of conventional U. S. Bureau of Reclamation design, the 9½-foot-diameter tunnel pierces a metamorphosed geological formation which changes from station to station. It runs through banded gneiss and some chlorite, talc, quartz, and feldspar. In some cases, folded clay seams were encountered.

With this varied formation, the support job turned out to be larger than anticipated. About 80 per cent of the tunnel is supported by 5 and 6-inch steel bracing on 5 and 7-foot centers. The formation has also necessitated a varied excavation pattern which ranges from 20 to 36-hole rounds.

Work is proceeding from one heading at the downstream end of Weber Canyon. The tunnel portal, only a mile off U. S. 89, the main transcontinental highway, is served by a good access road. At the portal are the compressor house, office, equipment-repair shops, warehouse, and powder-storage facilities. This area is served with electric power by Utah Power & Light Co.

Equipment includes a pair of Joy-Sullivan 1,500-cfm electric-driven compressors. Ventilation is supplied to the heading by a Sutorbilt electric-driven fan and a Naylor 22-inch pipeline. The main air-supply line is 6 inches in diameter.

(Continued on next page)



Workmen install steel arches. The tunnel supports supplied by Commercial Shearing & Stamping Co., Salt Lake City, Utah, come in two pieces and are bolted together at the top.



Muck from the tunnel is dumped on a spoil bank near the portal. The cars, made to the contractor's specifications, hold 124 cubic feet of muck.

Check your Tackle Blocks for best service. Worn sheave grooves, bearings and pins are expensive.

LOWER HANDLING COSTS

• Blocks correctly designed and engineered for your specific operation save money.

Our engineering services are available for your specialized needs.

Over a quarter century of service.

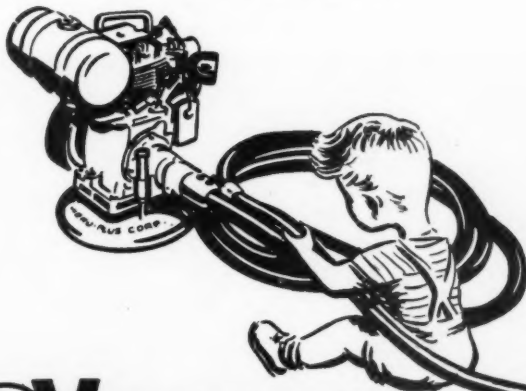
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The Patented Internal Vibrator That Keeps Upkeep Costs Down...

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It requires no maintenance or lubrication on the job. It is factory lubricated and needs relubrication only after the job is done.

A really fool proof unit which is covered by a 6 month guarantee.

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PRODUCTS, INC.

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With the drilling completed, miners work from the jumbo to load the holes with Atlas Gelodyn No. 3 powder. Shots use standard delays up to and including No. 8.

(Continued from preceding page)

The repair shops, equipped to handle major overhaul jobs, can pick up and charge banks of storage batteries for the electric locomotives. Outside the shop and administrative area is a level yard for the storage of timber, wood lagging, wedges, structural steel ribs, and blower and air-supply pipe. The powder magazines, dug far back in the side of the hill, are kept locked at all times. This main yard is being constantly enlarged as broken rock from the tunnel excavation is dumped at the canyon mouth.

Drilling, Loading, and Mucking

Rock is being pulled out of the tunnel face in a pyramid-type cut consisting of several holes drilled close to the center of the cross section. All drilling is done by five Ingersoll-Rand DA-35 machines, three of which are on aluminum shell mounts on the single deck of a 5-machine drilling jumbo. Two other machines, working from the tunnel floor, sink lifters and some of the rib holes.

Using 9-foot maximum-length I-R steel and Carset bits with tungsten-carbide inserts, the drifter-type drill rigs are used for about 35 linear feet before being sent to the I-R sharpener in the bit shop. Keeping the standard factory gage has lengthened bit life appreciably. The worst day saw only 11 linear feet drilled, but in the best 24-hour period, 72 feet of finished supported tunnel excavation was produced.

Holes are loaded with Atlas Gelodyn No. 3. In a few cases where hard-packed ground seams were found, Gelodyn No. 1 was used. Shots used standard delays, up to and including No. 8, with 440 volts on 700 feet of shooting line. Smoke was removed from the tunnel by the Sutorbilt fan before workmen returned to the face.

Mucking equipment consisted of an Eimco 40, with an Eimco 21 standing by. The arrangement was sometimes awkward because of the length of the Granby-type 124-cubic-foot hauling cars. These were made to company specifications in Wallace, Idaho, by Coeur d'Alene Hardware & Foundry Co., and they are 12 feet 4 inches over-all and have a wheel-base of 5 feet 5 inches.

Trainloads of material are dumped over the waste area by a portable telescoping hydraulic ram which has sections ranging from 5¼ to 3 inches in diameter in ½-inch increments. Operating on the narrow-gage railroad track are three Greensburg locomotives and one General Electric locomotive, together with the cars. California switches are located at the mucking machine, about 1,500 feet from the Eimco so that bracing and drill jumbos can be stored, and about 10,000 feet from the portal. These switches are all 230 feet long from feather point to feather point.

Structural steel arches for tunnel supports are a product of Commercial Shearing & Stamping Co., Salt Lake City. Most of the sections are standard 5-inch H-shapes, but some 6-inch material was also used. These

sections are in two pieces, with a bolted connection at the top. Two special steel cars, each carrying ten complete sets, hauled the sections. Set in place on 5-foot centers, they were sometimes lagged with timber breastboards, particularly in soft material and ground water.

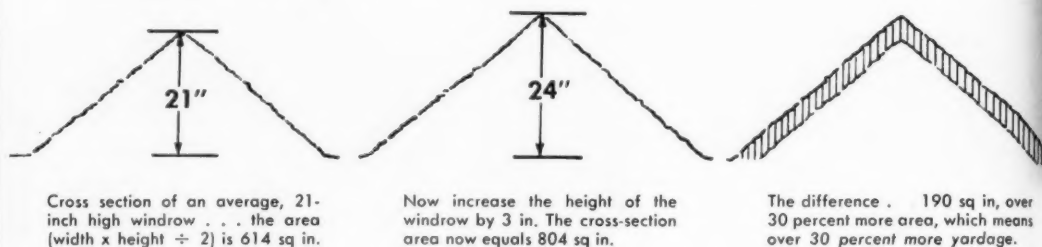
Water inside the tunnel has not been excessive, however. About 300 gpm was developed when the tunnel had advanced 500 feet, and no increase has been noticed as excavation continues. Pocketed water was found in several places, but as soon as the first heavy surge had worked its way outside, the face was ready to be worked again.

Project Development

Gateway Tunnel marks first construction on a project planned since 1942, when the need of water for

QUESTION*

How much more material is there in a Three-Inch-Higher Windrow . . . 9% . . . 18% . . . 31% . . . ?

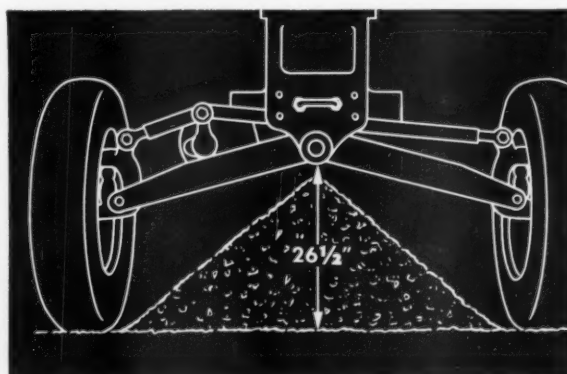


*Only a Combination of Advanced Design Features Lets a Motor Grader Handle Big Loads Fast

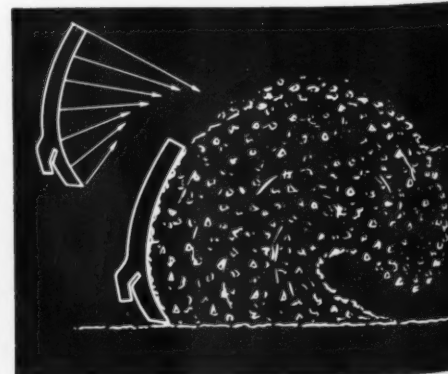
To take full advantage of even a *three-inch* difference in windrow height (as explained above) a heavy-duty motor grader needs new design and performance characteristics from front to rear . . . and from the top of the main frame to the bottom of the blade. No single

feature can give you the increased work capacity that is so essential on road construction, maintenance and oil-mix jobs.

Now let's analyze the Allis-Chalmers 104-brake-horsepower AD-40 to see how it measures up to these stiff requirements.



1 A high-arch front axle to straddle big windrows . . . take advantage of that 3-inch difference and let big loads pass through to the blade.



2 A rolling-action moldboard . . . to insure a "live" load that rolls freely off the blade . . . moves the load faster and takes full advantage of engine power.

agriculture, industry, and municipalities became aggravated by the area's population growth. The problem of an adequate water supply, however, has always been an important one.

Water from the Weber River was first turned out on a thirsty piece of ground about 1850 by Mormon pioneers. By 1896, more than 100 canal companies had begun to divert water from the river or its tributaries and had established rights to all of the normal summer flow.

One of the first storage developments, the 3,850-acre-foot East Canyon Reservoir, was built by private interest on a Weber tributary in 1896. In 1916, this was enlarged to 28,730 acre-feet. Irrigation companies also built a number of small reservoirs, ranging up to 1,900 feet, prior to the reign of the Bureau of Reclamation.



Close-up of the miners setting the Commercial Shearing & Stamping steel arches. Most of the tunnel is supported by these 5 and 6-inch H-sections. In soft material, they are lagged with timber breastboards.

Since then, two reclamation reservoirs were built on the river: the 74,000-acre-foot Echo Reservoir in 1931, part of the Weber River Project, and the 44,000-acre-foot Pineview Reservoir, part of the Ogden River Project. Both reservoirs supply existing canals. The Ogden River Project also included the Ogden-Bingham and South Ogden Highline Canals. The Weber-Provo Diversion Canal, diverting some water high on the Weber River to the Provo River, was originally part of the Weber job. Later it was enlarged for the Provo River Project.

Despite this work, undependable water supplies slowed industrial and agricultural development in the region. Only above-normal precipitation in the last few years has averted serious water shortages.

Part of Huge System

The multiple-purpose Weber Basin Project is part of a huge plan which will entail about \$71,000,000 worth of construction and engineering work. New reservoirs at the Wanship, Lost Creek, and Willard sites, and the enlargement of the existing reservoirs at Pineview and East Canyon, together with the inclusion of the Echo Reservoir as part of the project, will combine to regulate the Weber River.

All of these reservoirs, excepting Willard on the shore of Great Salt Lake, are in mountain areas. Water from these reservoirs will be diverted by existing works, some of which will be modified, but new facilities will do the bulk of the job.

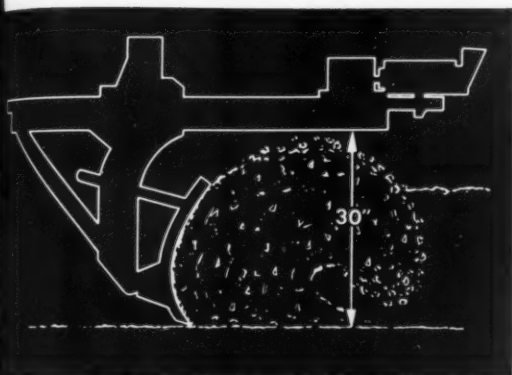
Gateway Canal will head on Weber River at the Stoddard Diversion Dam just below the town of Morgan. It will extend west 11.8 miles on the south side of Weber Canyon. The last 3.3 miles, in the tunnel now under construction, was given top priority.

At the tunnel's outlet on the west face of the mountain, the Weber aqueduct will extend north 4.3 miles to the outskirts of Ogden, and the Davis aqueduct will take water south 21.8 miles, almost to Salt Lake City. Both will be reinforced-concrete pipelines, 84 inches in diameter, and will carry water for agricultural, industrial, and municipal use.

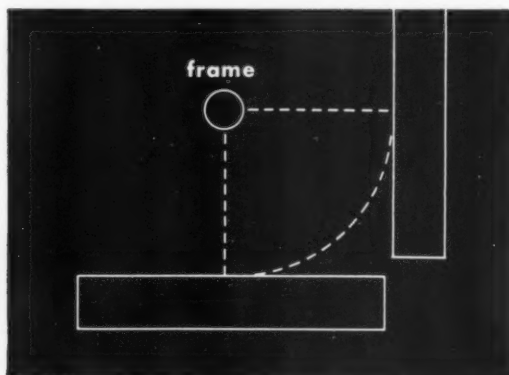
Flows which cannot be controlled by the mountain reservoirs will be diverted from the Weber River at the Slaterville Diversion Dam west of Ogden, to be carried 11 miles north in the Willard Gravity Canal to Willard Reservoir on Great Salt Lake. Water will then be pumped from this reservoir as needed. This will involve a 63-foot lift which will permit the water to be returned to the river through the Willard Pump Canal. Willard Reservoir water which is returned to the river can be pumped into the Layton Canal by a 25-foot lift. This canal, heading at the Wilson Diversion Dam on the Weber River west of Ogden, will take irrigation water southward for 20 miles.

The project will include wells for water supply and for lowering the water table, surface, and deep drains for reclaiming waterlogged lands. Two hydroelectric plants, one driven by water from Wanship Dam and the other by water returned from Gateway Canal to the river, are also included.

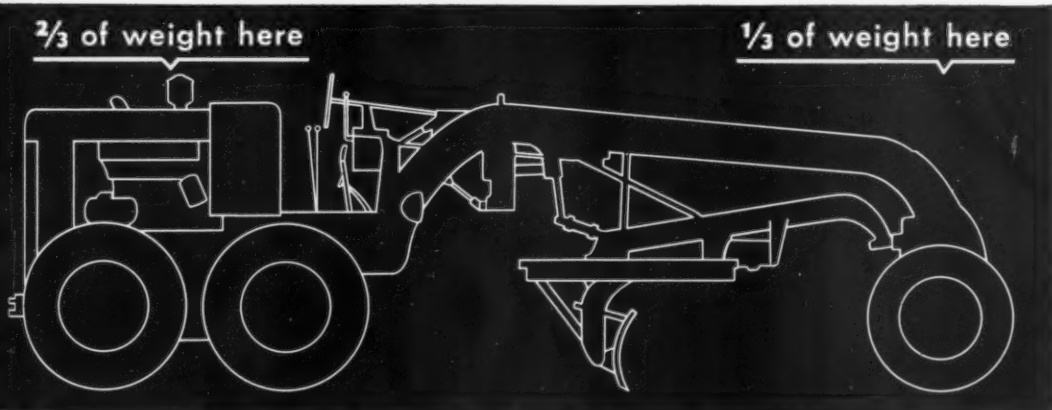
Planning for the program, begun



3 Ample throat clearance . . . to handle 30 percent bigger loads without disturbing free, rolling action . . . and without jamming dirt, oil-mix or any other material against the circle.

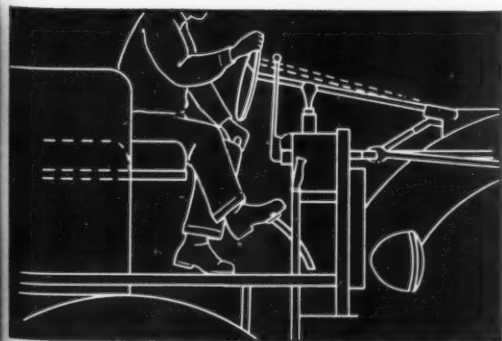


4 Full blade freedom . . . the exclusive tubular frame and a long tubular drawbar insure full blading effectiveness on the road, in the ditch or on the slope.



5 Blading accuracy is essential. A long wheel base, the tubular frame . . . and lift-cases located directly over the circle, provide smooth, accurate finishing.

6 Balanced power, weight and traction . . . a heavy-duty engine and two-thirds of the weight concentrated on tandem-drive rear wheels provide the best in traction, positive blade pressure and steer-ability.



7 Easy control and visibility — A big platform with plenty of leg room . . . adjustable seat and steering wheel . . . power steering will assure working ease. Single member frame, low control board and tapered platform corners provide "pilot-house" visibility.

This design, that combines working advantages every owner needs and wants, exists in only one motor grader . . . the Allis-Chalmers AD-40. That's a fact . . . a fact your Allis-Chalmers dealer will be glad to prove to you. Ask him to show you how the AD-40 gives you the differences that mean more work done . . . by a demonstration under on-the-job conditions.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

AD-40 Motor Grader
104 brake hp • Weight — 23,000 lb

in 1942, was discontinued during the war years. It was resumed in 1946, and by 1948 most of the investigations were finished. Following a 1949 project report, Congressional authorization was granted for the work, and the first appropriation of \$1,350,000, covering work now under way, was made in 1952.

After Congress had approved the project, the Weber Basin Water Conservancy District was created, June 26, 1950. On December 12, the day Utah Construction Co. began operations, a contract providing for repayment of \$57,694,000 in 60 years' time was signed by W. R. White and E. J. Fjeldsted of the conservancy district and E. O. Larson of the Bureau of Reclamation.

The Weber Basin Project is part of the reclamation program administered under the supervision of Re-



General superintendent and project manager for Utah Construction Co. is H. C. Miller, left, who here talks over the work with C. J. Getz, office manager.

gion 4, headquartered in Salt Lake City, with E. O. Larson as regional director. Field work is being supervised by C. D. Woods, acting area engineer; Ross D. Billings, construction engineer; and Reed Gunderson, chief inspector.

Utah Construction Co. personnel under General Superintendent H. C. Miller include Chuck Eaton, Carl Prescott, and Howard Hitson, shift bosses; Jack Stallard, J. D. Kimsey, and D. H. Walker, walkers; Don Roberts, master mechanic; John Gateley, chief electrician; and C. J. Getz, office manager.

THE END

Line of Crawler-Tractors And Attachments Available

■ A full-line catalog showing the Terratractor tractors and matching equipment has been issued by the

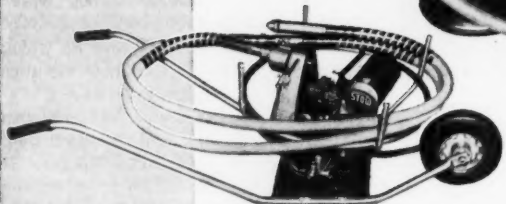
American Tractor Corp., 800 Fort Wayne St., Churubusco, Ind. The catalog stresses the fact that all models of Terratractor crawler tractors are available with bulldozers, angle-blade dozers, digging loaders, and winches.

The tractors are available in models rated from 25.8 to 30 drawbar hp. Hydraulically controlled Terradozer bulldozers are offered in models ranging from a small unit for light dozing and backfill work to a blade 27 inches high and 72 inches wide for heavy work. Also shown is the Terra-A-Dozer which can be used as either a straight or angle-type dozer. A bucket loader, the Terraload'r, is also illustrated.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 605.

New performance features built into STOW CONCRETE VIBRATORS

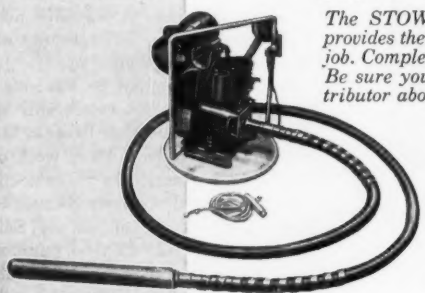
MODEL AG



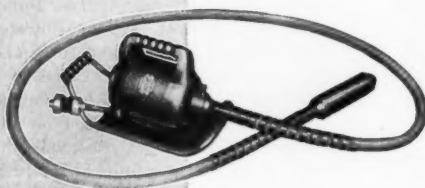
SHOWN: MODEL BGW. This is the standard STOW model BG vibrator, mounted on wheelbarrow for easy maneuverability. Model BG & BGW feature 2 HP 4 cycle, air-cooled engine; ball-bearing eccentric belt tensioner.

Contractors like STOW vibrators because the high operating speeds of this new STOW vibrator line make possible the use of heavy duty, light weight flexible shafting, and lighter, more efficient vibrator heads. And STOW design provides convenient speed control so that attachments for rubbing, grinding, cleaning may be used directly on the vibrator shafts, making it unnecessary to purchase extra shafts for this purpose.

The STOW line is complete . . . provides the right vibrator for every job. Complete accessories available. Be sure you see your STOW distributor about the STOW line!



MODEL J—The lowest priced vibrator in the STOW line. Slower speed means longer, trouble-free operation. Model J features 3600 (max.) VPM, 2 HP 4 cycle air-cooled engine, and direct drive.



MODEL BU—Features 2 HP at 9000+ VPM, operates on 115 volts AC or DC with splash-proof, high speed ball-bearing motor.

See how STOW can save money for you! Send for Free Bulletin 526.

STOW

MANUFACTURING CO.
40 Shear Street, Binghamton, N. Y.

PIPE WITH A "ONE-TWO" PUNCH



Naylor light-weight pipe is your best bet to "knock out" gas, fumes and stale air in underground operations. In push-pull ventilation, it gives you a "one-two" punch that can't be matched in the light-weight class because no other light-weight pipe has Naylor's exclusive lockseamed-spiralwelded structure. The extra collapse strength provided by this structure makes it possible to build Naylor vent pipe of lighter gauge material without any sacrifice of performance. Other savings are assured through use of the Naylor one-piece Wedge-Lock Coupling—the quickest possible connection available today.

Write for Bulletins No. 507 and No. 514 to get the full story on this unbeatable Naylor combination.

NAYLOR PIPE

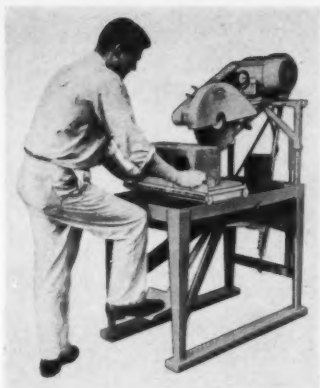
Naylor Pipe Company • 1270 East 92nd Street, Chicago 19, Illinois
Eastern U.S. and Foreign Sales Office: 350 Madison Avenue, New York 17, New York

CONTRACTORS AND ENGINEERS

New Masonry Saw

■ A new masonry saw, developed by the Felker Mfg. Co., 1125 Border Ave., Torrance, Calif., has been designed for use on all masonry materials. This new cut-off saw operates either wet or dry and uses either diamond abrasive blades or ordinary abrasive cut-off wheels. It performs all types of operations such as step cutting, through cutting, skew cutting, and angle cutting.

A feature of this latest Di-Met saw is its speed of adjustment. All adjustments are made from the operating position. The head rises to any necessary height on two telescoping standards located at the rear of the machine. It is mechanically lifted from the front by a series of pumps on the foot pedal. Height adjustment is sufficiently great to per-



This new Di-Met masonry saw features quick head adjustment.

mit the arbor to remain in a horizontal position regardless of the size of the work. The arbor can be tilted,

however, and rigidly locked at the desired angle. The arbor assembly is fabricated of formed steel tubing. The head lowers by gravity. The speed of descent is kept under control by an adjustable hydraulic retardant.

For further information write to the company, or use the Request Card at page 18. Circle No. 626.

Self-Powered Scrapers And Bottom-Dump Trucks

■ Two new catalogs are available covering the 17-yard bottom-dump trucks and the self-powered scrapers manufactured by the Euclid Division, General Motors Corp., 1361 Chardon Road, Cleveland 17, Ohio. The booklet on bottom-dump trucks stresses their favorable horsepower-to-weight ratio. Because they

are interchangeable with the 15.5-cubic-yard Euclid scrapers, they give the user operating flexibility. The trucks haul loads of 20 cubic yards heaped at a 3 to 1 slope and 25.5 cubic yards heaped at 1 to 1 slope at speeds up to 28.2 mph.

The Euclid Twin-Power scraper, described in Catalog No. 551, hauls loads of 18 cubic yards struck, 21 cubic yards at a 3 to 1 slope, and 24 cubic yards at a 1 to 1 slope. It travels at speeds up to 31 mph and has the ability to self-load in most materials.

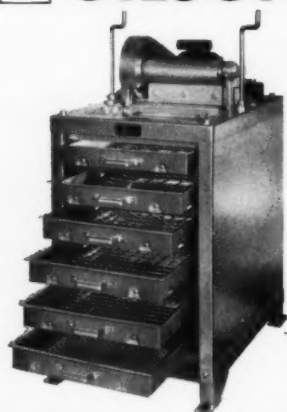
Brief specifications and typical performance figures, as well as individual design features, are included in the catalogs.

To obtain this literature write to the company, or use the Request Card bound in at page 18. Circle No. 596.

SPECIFY

Size Testing
by

✓ **GILSON**



If guaranteed quality is what you want, insist on a GILSON Test Report with every shipment.

The GILSON Mechanical Testing Screen cuts out error and guesswork in complying with sizing requirements for crushed stone, gravel, slag, coal, ores and all similar materials... guarantees that every carload, every truckload is as-ordered.

A GILSON Test Report is the sizing standard of industry.

A Sand Attachment for handling 8-inch sieves is optional equipment.



For guaranteed quality
**ALWAYS SPECIFY
GILSON—**

1. Makes Tests quickly and accurately
2. Two to seven separations simultaneously
3. Screen trays independently removable
4. Trays balanced to same tare weight
5. Visible separation to refusal
6. Few moving parts
7. Sturdy construction
8. Size range 4" to 200-mesh

For research projects, the GILSON Screen is the answer to moderate-scale mass separation jobs.

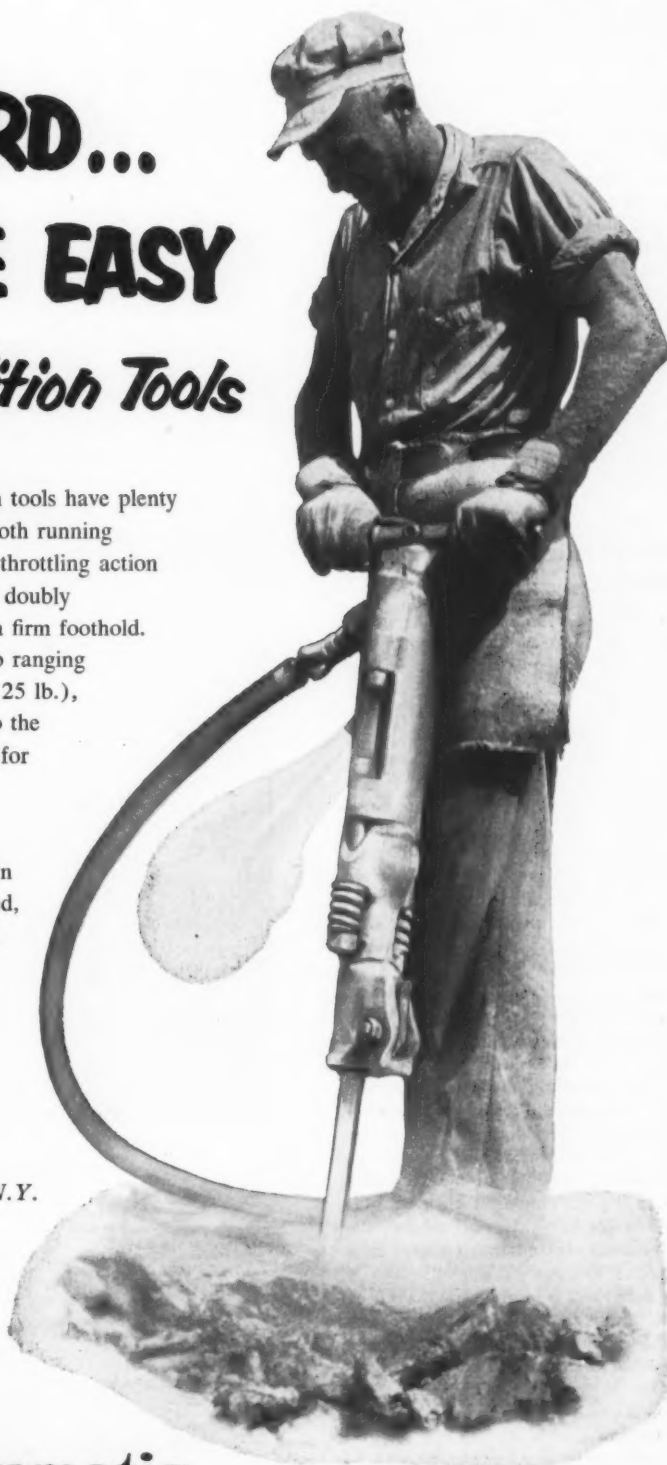
GILSON SCREEN CO.
MALINTA, OHIO

HIT HARD... HANDLE EASY CP Demolition Tools

Chicago Pneumatic demolition tools have plenty of extra power. Yet, their smooth running characteristics and responsive throttling action make them easy to handle and doubly safe where it's difficult to get a firm foothold. Available for every type of job ranging from the lightweight CP-111 (25 lb.), for lateral or overhead jobs, to the hard hitting CP-117 (80 lb.), for rugged, heavy-duty work.

"Hit hard and handle easy" also applies to all rock drills in the CP line — the fully cushioned, low maintenance Sinker Drills, Drifters and Stoppers; and the light and heavy duty wagon drills — and for exploratory drilling don't overlook the CP line of diamond drills.

For information write
Chicago Pneumatic Tool Co.,
8 East 44th St., New York 17, N. Y.



Chicago Pneumatic

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES



New Electric Plant

■ A new 5,000-watt ac air-cooled lightweight electric plant is in production at the Kohler Co., Kohler, Wis. The new Model 5RM61 is designed for installations where a liquid-cooled unit is not practical.

Powered by the Kohler K660 engine, a two-cylinder, opposed, four-cycle engine, the new plant is available in 115-volt and 115/230-volt single-phase ac models. Either manual or remote starting is offered in all models. Remote-starting models are equipped with automatic chokes. The unit is 23 $\frac{1}{2}$ inches wide, 28 $\frac{1}{2}$ inches high, 32 $\frac{1}{2}$ inches long, and weighs approximately 480 pounds.

Cooling of the engine is accomplished by a blower and housing with baffles. Air is directed around the finned cylinder and head areas. The manufacturer states that because the unit is air-cooled, antifreeze is not necessary for cold weather operation.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 628.

Electrodes Are Coated With Powdered Metal

■ The second in its newly developed line of electrodes with powdered metal in their coatings has been announced by The Lincoln Electric Co., P. O. Box 5758, Cleveland 17, Ohio. Called Jetweld 2, the new electrode is designed especially for welding butt and deep-groove joints. It is a companion to Jetweld 1, announced earlier and designed for welding horizontal and flat-fillet joints. These electrodes have been developed for specified types of joints rather than as all-purpose electrodes.

Jetweld 2 is said to weld at the lowest cost per foot of weld. It is reported to have excellent X-ray qualities, easy slag removal, top physical properties, smooth appearance, and low crack sensitivity.

The company states that certain operating difficulties inherent in conventional electrodes are overcome by powdered metal coatings. First, an additional source of metal is available to permit higher deposition rates at usable currents, and second, the problems created by excessive heat in the arc are eliminated.

Jetweld 2 is used with either ac or dc, although ac operation is preferable. The electrode is classified as E-6020 and meets all E-60 classifications in the downhand position. It is available in $\frac{5}{32}$, $\frac{7}{32}$, $\frac{1}{8}$, and $\frac{1}{4}$ -inch diameters.

For further information write to the company, or use the Request Card at page 18. Circle No. 543.

Line of Masonry Drills

■ An improved line of rotary masonry drills has been announced by Termite Drills, Inc., 99 N. Lotus Ave., Pasadena 8, Calif. Termite drills are offered in standard diameters from $\frac{1}{8}$ to 5 inches and are available up to 8 inches in diameter on special order. Lengths up to 36 inches are obtainable. These drills are used with standard electric or air motors.

A recent improvement in the drills is a specially designed collar that facilitates the changing of shanks when different lengths of drills are desired. All drills of $\frac{7}{8}$ inch or more in diameter have interchangeable shanks.

A feature of the drill is the worm, which starts right at the grinding inserts. The worm withdraws the pulverized residue from the hole and



The Termite masonry drills feature a worm that starts right at the grinding inserts and withdraws the pulverized residue from the hole.

carries it away the instant it is pulverized. The grinding inserts used on the drills are made of a material composed of vacuum-sintered tungsten titanium carbide, which is said to make for longer drill life and faster penetration.

The manufacturer has announced a reduction in the price of many of these drills.

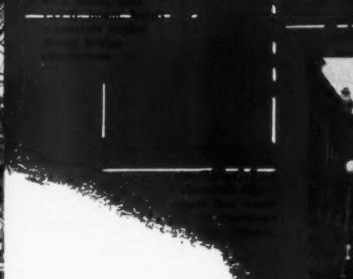
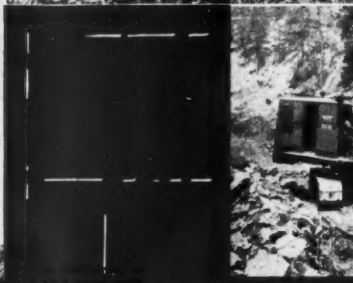
For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 629.

Fuller Division News

H. J. Passage, sales representative for the transmission division of Fuller Mfg. Co., Kalamazoo, Mich., has been placed in charge of sales of Shuler axles in Manitoba, Quebec, Ontario, and the Maritime Provinces.

BUCYRUS-ERIE make money for

In Washington
38-B crane, equipped
with special
hoisting boom
logs in



In New Mexico,
hard malpais rock
is cleaned from a
pipeline trench
by a $\frac{3}{4}$ -yd. 22-B
dragshovel equipped
with tractor-type
crawlers.

Powder-Actuated Tool Has Increased Power

■ A powder-actuated tool designed to drive heavy-shank fasteners into structural steel plates up to an inch thick and into hard concrete is announced by the Ramset Division, Olin Industries, Inc., 12117 Berea Road, Cleveland, Ohio. Pins and studs driven into 1-inch structural steel with the Ramset Super-Power Jobmaster are reported to have a holding power up to 10,000 pounds.

The new tool weighs less than 8 pounds and is 15 inches long. It is designed for either one or two-hand operation and sets pins and studs $\frac{3}{8}$ of an inch in thread or head diameter at an average rate of one or more a minute. It uses any of 19 Ramset-designed fasteners and takes any of four powder loads to



The Ramset Super-Power Jobmaster, a new powder-actuated tool, drives fasteners through one-inch-thick steel.

handle virtually any work.

The new powder loads designed for this tool are of the center-fire type and are longer than previous loads. They feature a plastic wad which acts as a gas check, eliminating

power distribution leakage of gas down the barrel and preventing spalling of concrete at the point where the pin or stud is driven.

Another feature, a circle-set shield, permits the setting of fast-

eners as close as $1\frac{1}{4}$ inches from the edge of the shield. The shield has quadrant markings for exact positioning and may be converted to half-shield position in an instant.

For further information write to the company, or use the Request Card at page 18. Circle No. 638.

Plastic Surface Level

■ An all-plastic 24-inch surface level, said to withstand rough abuse and still remain accurate, is announced by the Creative Plastics Corp., Stony Brook, L. I. The company also offers a pocket-size line and surface level and a 9-inch torpedo level.

The frame of the 24-inch level is a one-piece impact and heat-resistant styrene molding. The surface



This 24-inch level is the largest of the Level-it line of plastic levels. The bubbles are imbedded in a Lucite sheath.

level consists of a horizontal glass vial embedded in a Lucite sheath and inserted in a cavity in the top of the frame. Two plumb levels are placed vertically in openings at either end of the frame. The Lucite covering magnifies the bubbles and absorbs light for easier reading. The 24-inch Level-it level weighs only 12 ounces.

For further information write to the company, or use the Request Card at page 18. Circle No. 639.

Tractor Improvements

■ A new heavy-duty track roller frame and special large idlers for the 60-inch-gage Caterpillar D4 track-type tractor are made by the Caterpillar Tractor Co., Peoria, Ill. The new arrangement is especially useful whenever rugged terrain is encountered in operations such as bulldozing.

Heavier boxed-in frames and replaceable wear strips are offered for the front idler hold-down bearings.

For further information write to the company, or use the Request Card at page 18. Circle No. 640.

Data on Paving Breakers

■ Two new bulletins describing its latest models of paving breakers and air tools for construction work have been announced by the Gardner-Denver Co., S. Front St., Quincy, Ill.

Bulletin PB1 gives the features and specifications on Gardner-Denver heavy-duty, medium-weight, and lightweight paving breakers. It also describes sheeting driver, pin driver, and spike driver attachments and other tools used with these paving breakers.

Bulletin ST-100 describes and gives the specifications for Gardner-Denver clay spaders, trench diggers, and single pad and triplex backfill tampers.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 516.

eyfor contractors

ALL OVER
THE COUNTRY



In Vermont, a road to a new dam site is cut through a hillside by a $\frac{3}{4}$ -yd. 10-B shovel.

Wherever you go, you'll see Bucyrus-Erie excavators and cranes on construction projects of all types . . . making money for their owners. Why? Because contractors everywhere recognize the value of Bucyrus-Erie Individual Design. Each model is designed from the ground up to do the most effective job of handling its rated load. Speed, power, strength and weight are all properly proportioned for efficient, economical operation.

Find out what Individual Design can mean to you on your jobs. Get all the facts from your nearby Bucyrus-Erie distributor.

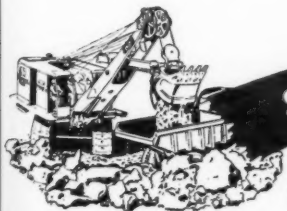
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**BUCYRUS
ERIE**

SOUTH MILWAUKEE, WISCONSIN

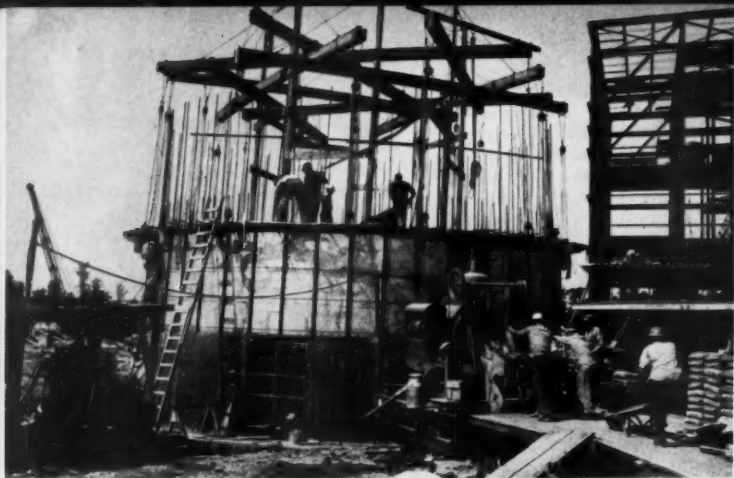


In Florida, a $2\frac{1}{2}$ -yd. 54-B performs ditching operations in the Everglades.



See Your Bucyrus-Erie Distributor

SHOVELS • DRAGSHOVELS • DRAGLINES • CLAMSHELLS • CRANES



Workmen make the second pour on the reinforced-concrete stack which will rise 504 feet above the ground. Concrete for the stack is turned out by a CMC 16-5 electric-powered mixer. C&E Staff Photo

BLAW-KNOX ROAD WIDENERS

**Lay concrete WITHOUT FORMS,
asphaltic concrete and all kinds
of aggregate!**

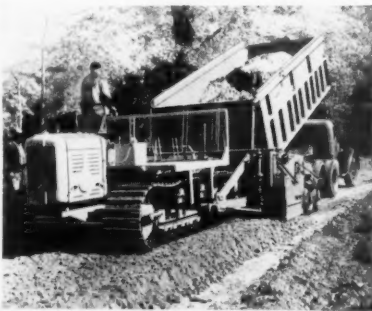


Cut costs on your widening jobs

ON A TEN MILE concrete strip, six feet wide, a Blaw-Knox Apsco Road Widener has saved over \$10,000! No forms are required with these time- and labor-saving units. The strike-off gate confines and distributes the concrete over the desired strip, then the independently powered vibrator "sets up" the concrete which is neatly shaped by the trailing shoe. The Blaw-Knox Apsco Widener handles up to 6-ft. widths at a rate of 150 tons per hour, spreading and finishing concrete up to 1½ miles a day. Handling dirt, gravel or stone, it builds shoulders at a 200 ton per hour clip. It's a heavy-duty money saver, available in two sizes for spreading up to 10' widths. Write for Bulletin 2458.

BLAW-KNOX APSCO BASE PAVERS

Big capacity Base Pavers, with plenty of traction and power, handle stone, slag, gravel, soil cement or road-mix aggregates to spread accurate base course with no segregation of material. Two sizes meet every requirement for fast, low-cost operation. Write for Bulletins 2457 and 2459.



Ask your **BLAW-KNOX DISTRIBUTOR** about the "Complete Packages" of Concrete Paving and Ready-Mixed Concrete Equipment

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION

PITTSBURGH 38, PENNSYLVANIA
Offices in Principal Cities



Mill and Smelter Are Part of

**Ore-processing facilities and
nearby town for workers
comprise \$70,000,000 project**

DRIVING THROUGH the heavily timbered Ottawa National Forest in Michigan's upper peninsula, one is surprised to come suddenly on a cleared area which is literally humming with construction activity. Here, in the midst of such scenic splendor as the Porcupine Mountains, the Lake of the Clouds, and beautiful Lake Superior, crews are at work on a \$70,000,000 building project.

About 20 miles southwest of Ontonagon, Mich., and just five miles from Lake Superior, the White Pine Copper Co. development is taking shape. Within a half-mile radius are the copper mine entrance, from which 12,500 tons of ore will pour daily, and the mill and smelter, which will refine approximately 75,000,000 pounds of copper annually. Nearby, a new city is springing up to provide community life for some 800 plant and mine employees and their families. It is expected that the town will have a population of about 2,000 when the development is in full swing.

Unprecedented peacetime as well as wartime demands for copper prompted the directors of the Copper Range Co., Boston, Mass., to establish the White Pine Copper Co., and to invest \$13,000,000 of their funds in its development. An RFC loan of \$57,000,000 gave the new company a total working capital of \$70,000,000 with which to construct and put into operation the mine, mill and smelter, and town site.

General contractor and agent for the White Pine Copper Co. is Turner Construction Co., New York,

N. Y. A large number of subcontractors are cooperating in the venture, each doing his specialized type of work. The mine is well under development, and completion of the entire project is set for November of this year.

Many Structures Included

A large number and a great variety of structures make up the project. They vary from single-family dwellings in the new town to a reinforced-concrete stack 504 feet high. Included are smelter buildings, powerhouse, mill building, concrete storage silos, repair shop, warehouse, administration building, and many others. Several miles of railroad track serve every part of the plant area, and a 14-mile spur connects the site to the main line of the Duluth, South Shore & Atlantic Railroad at Bergland.

At the ore transfer plant, five reinforced-concrete ore bins, each 50 feet in diameter, rise 105 feet above grade. The crusher building, housing five Nordberg 750-tph cone crushers, extends laterally another 30 feet. The roof is 135 feet above the ground. Footings for this structure were a special problem because of the extremely heavy weight of the structure and its contents and the nature of the underlying soil. Forty feet of glacial till and clay underlie the entire construction area. Many large boulders are interspersed throughout the clay, making it impractical to drive piling.

The footing as constructed consists of a reinforced-concrete slab, approximately 60 x 260 feet, resting

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CONTRACTORS AND ENGINEERS

Part of Industrial Development

Concrete footings for the White Pine smelter are poured by a Bucyrus-Erie 22-B crane using an Insley 1-yard bottom-dump bucket. International trucks carrying Rex 5-yard mixers deliver the concrete. C&E Staff Photo

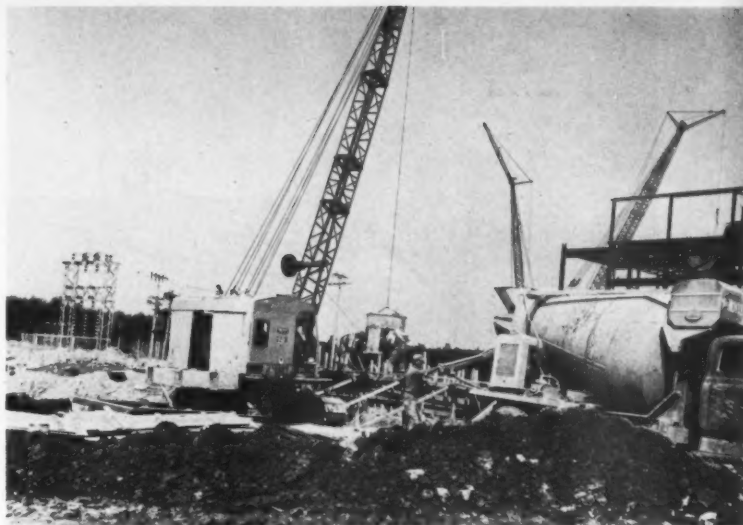
on the clay below the frost line. A series of low walls on this slab divides the area into a number of cells. Precast-concrete slabs resting on the walls close the top of the cells.

On this base the 5 ore bins were constructed as a monolithic unit, using slip forms. The crushing-plant equipment and its protective building were constructed nearby. Belt

conveyors will carry the ore to and from this unit.

Belt conveyors play a major role in transporting the ore from the mine to and through the processing plant. In the mine, the ore is loaded into Dart, LeTourneau, and Joy shuttle-car trucks carrying 18 tons of ore and powered by diesel engines. These trucks haul to the Rogers primary

(Continued on next page)



backfill problem

How Else Could You Do It?

IN JEFFERSONVILLE, INDIANA the E. H. Hughes Construction Co. had dug a 3' wide trench for a lateral sewerline to a depth of 12'—in some places 15'—to tie in to an existing sewer main. This spoilbank along the edge of a built up residential street (hidden by spoilbank in photo) presented a real backfilling problem. Because the street had to be kept open to traffic and dust raising held to the minimum, the huge spoilbank could not be filled from the street side.

Hughes solved the backfilling problem—and at the same time compacted the filled trench—with a one-man-operated machine, the Cleveland Model 80-W. Needing minimum working space, easily able to pass under tree branches

and clear all obstructions, the compact 80-W worked off the street, travelling parallel to the trench on the opposite side from the spoilbank. The street was kept open and the dust problem minimized.

The one-man 80-W did the complete filling and compacting job simultaneously as it travelled, cleaned up and left the job ready for immediate repaving. Its low ground pressure and perfect balance on wide full crawlers practically eliminated damage to the lawns, sidewalks and driveways it crossed.

Because of its unique versatility the Cleveland 80-W is saving owners time and money on a wide variety of pipelaying, trench filling and trench compaction jobs.

Write for descriptive literature and specifications or get the full story on CLEVELANDS from your local distributor.



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COFFING'S NEW SAFETY HOOK

You are invited to compare this new Coffing Safety Hook, and see for yourself its many advantages — in safety to men and equipment, in convenience and ease of use.

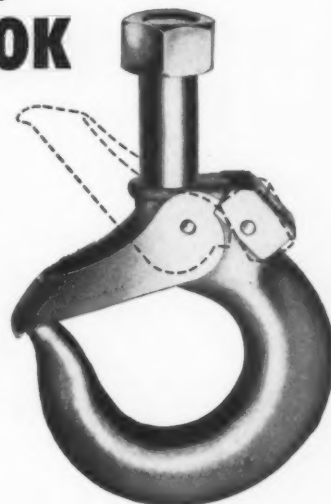
POSITIVE LOCK under spring tension securely holds the latch in place.

NO SIDEWAYS MOVEMENT POSSIBLE, because latch fits snugly over point of hook.

HIGHER TENSILE STRENGTH than any other hook of its size. Has drop-forged, heat-treated alloy steel construction.

NO RUSTING OR CORROSION to hinder use, because the hook is cadmium plated.

EASILY RELEASED — HELD OPEN — Slight pressure on the release un-



locks the latch. Spring tension on the release also holds the latch open.

LARGE THROAT OPENING allows full and unobstructed use of entire area inside the hook.

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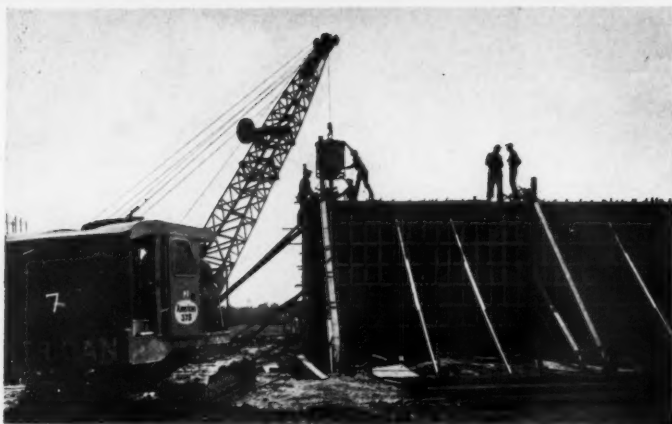
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Sold By Distributors Everywhere



An American 375 crane hoists concrete to the top of wall forms being used in the construction of the smelter. Here an Insley 1/2-yard bucket is used to hold the concrete lifts.

C&E Staff Photo

(Continued from preceding page)

crushers within the mine. Here the ore is reduced to minus 8 inches and discharged onto a 54-inch conveyor belt which carries it out of the mine on a 16 per cent grade.

Other belts carry the ore to storage or to succeeding crushing and grinding stages. Some conveyors rise high in the air on steel towers to carry the ore from the crushing plant to the top of the ore bins. All belts are housed to protect the material from weather.

504-Foot Stack

The Rust Engineering Co., Pittsburgh, Pa., had the contract for the reinforced-concrete smelter stack which rises 504 feet above grade.

The footing, which was constructed by Turner, is an octagon measuring

84 feet across. It is 13 feet deep and spreads the load on the underlying clay.

The stack measures 37 feet in outside diameter at the bottom and 15 feet at the top. Its walls are 2 feet thick at the bottom, 7 inches at the top, and contain more than 2,000 cubic yards of concrete. The entire interior is lined with acid-resistant brick.

Pouring is carried on from a platform inside the stack. A derrick centered within the stack has eight posts supporting a frame over the top. Eight chain hoists from the frame support the working platform, and 16 additional hoists are used to raise the metal form as each lift is completed. The first two pours above the base were made with the derrick resting on the foundation. Thereafter, the derrick was moved upward with each pour and supported from the inside of the stack.

The metal form consists of a series of vertical panels of 16-gage sheet steel bolted to vertical T-bars. Each panel is 29 inches wide and 8 feet high. The bottom of the form is cinched tightly around the top of the previous pour, and the top is supported by a circular ring made of 3 1/2 x 3 1/2 x 1/2-inch angles. Adjusting bolts, 30 inches long, hold the form the proper distance from the ring to accomplish the desired taper.

As the stack rises and the diameter becomes less, two of the sheet metal form panels overlap one another. When the diameter is reduced sufficiently, a panel is removed. The upper ring must also be re-bent to a smaller diameter from time to time as the form rises. Three cables drawn tightly around the outside of the form act as safety wales to prevent deflection of the form during pouring.

A special form panel is provided to accommodate the ladder rungs and cage braces. After each pour, this panel must be removed from the form, slipped out over the braces and rungs, and reassembled in its proper place when the form has been raised to the new position.

Concrete is mixed in a plant set up outside the base of the stack. A CMC electric-powered 16-S mixer is charged by hand. Sacked cement is dumped directly into the skip by

"This suggestion solved their problem....



... Saved them Money, too!"

The public works department of a large Southern county had run into a serious problem with their road building equipment.

Sinclair Representative J. E. Gilmer reports, "The oil being used was high-priced but certainly *not* up to the requirements of this type of equipment. Bearing wear was high and carbon and sludge were found in all of the engines. There was definite need of an oil with better oxidation stability under extreme operating temperatures and heavy load conditions.

Mr. Gilmer continues, "I suggested Sinclair SUPER TENOL®, pointing out that this oil contains special additives to clean engines and *keep them free* of carbon and sludge. Moreover, its better oxidation stability helps prevent corrosive wear of bearings and rings.

"The county warden gave SUPER TENOL a test — the results of which proved my suggestion was right. SUPER TENOL gave far better service than the more expensive oil previously used. Of course SUPER TENOL is now used exclusively in all of this county's road building equipment."

Why not give a Sinclair Lubrication Engineer the chance to help solve *your* lubrication problems.

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CONTRACTORS AND ENGINEERS



This belt drive and friction control unit operates the high-speed hoist used in raising concrete to the pours in the stack. A. M. Anderson, left, is the foreman for Rust Engineering Co., Pittsburgh, Pa., on the stack construction job. C&E Staff Photo

hand. Aggregate is wheeled from nearby stockpiles in Jackson wheelbarrows.

A typical 1/2-yard batch contains:

Type II cement	3	sacks
Gravel	939	lbs.
Sand	660	lbs.
Water	5 1/4	gals. per sack
Darex AEA	3	oz.

The slump of the mix is approximately 4 inches, and the 28-day strength exceeds 3,000 pounds per square inch.

From the mixer, the concrete is chuted to a 4-cubic-foot hoist bucket in the center of the stack. The bucket is hoisted to the pouring platform where the concrete is dumped into a buggy and wheeled to the forms. Hand puddling consolidates the mix in the forms.

The material-handling hoist was built by Rust Engineering especially for this type of service. The high-speed drum is mounted on an A-frame and is belt-driven through a friction-type regulating device. Power is furnished by a Howell 20-horsepower electric motor.

After the forms have been removed the surface of the concrete is sprayed with Truscon Tru-Cure concrete curing compound to prevent evaporation of the mixing water. The compound is applied with a hand spray. An 8-foot lift is poured every second or third day.

Structural Steel Frames

Most of the large buildings in the mill and smelter area have structural steel frames supported on spread concrete footings. Footings were constructed by Turner's crews.

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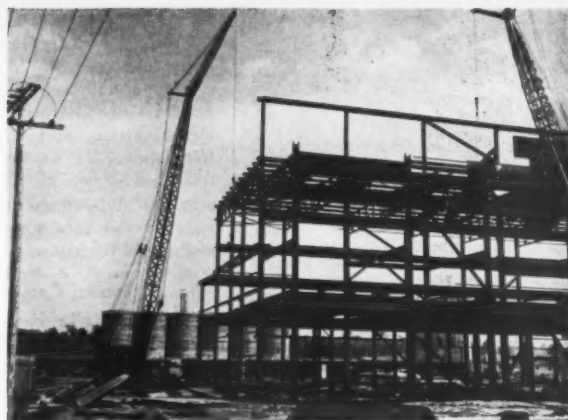
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JUNE, 1954



Manitowoc Speedcranes erect the framework for the steel powerhouse at the site of the White Pine development in northern Michigan's Ottawa National Forest. C&E Staff Photo



FROM BUILDER TO BUYER . . . BETWEEN MEN WHO KNOW

The Model S-75 Asphalt Plant, one of three Simplicity Plants owned by Ben M. Hogan and Company, Little Rock, Arkansas

HOW IMPORTANT IS PORTABILITY?

Portability is important . . . but just where does it rate? Experienced asphalt paving contractors will agree that it goes something like this:

1. DEPENDABILITY . . . Ability to consistently and dependably produce at least its rated output every hour—every day is the first and most important thing in any asphalt plant.

2. DURABILITY . . . An asphalt plant is a lifetime investment. It should be designed from practical experience and built of the best materials available. Every Simplicity plant ever built is still in active and profitable service (many for more than 25 years).

3. FUEL COST . . . Simplicity plants require no "warming up" and no "cooling off." The Simplicity INSULATED double shell dryer regularly saves OVER \$100.00 PER DAY in fuel cost alone on many jobs.

4. LABOR COST . . . Fewer men do a better job by producing more asphalt and better asphalt with a Simplicity plant. It is the payroll cost per ton—not payroll per day—that concerns you.

5. PORTABILITY . . . The portable Simplicity plant can be moved and erected READY TO RUN as quickly and at as low cost as any asphalt plant of comparable capacity. Yet Simplicity does not sacrifice Dependability, Durability and Economy of operation to attain this portability.

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THE SIMPLICITY SYSTEM COMPANY
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(Continued from preceding page)

In a typical concrete footing pour, the material is delivered in truck mixers from the batch plant and placed in the forms by an American 375 crane and a Bucyrus-Erie 22B crane, both using Insley bottom-dump buckets. A Homelite electric generator and vibrator provide the vibration.

Structural steel building frames were furnished and erected by American Bridge Co., Pittsburgh, Pa. Steel was fabricated at Gary, Ind., and Minneapolis, Minn., and delivered to the site by rail. Four Manitowoc crawler cranes and a Bay City locomotive crane handled and erected all the steel from the ground.

Included among the buildings using these frames were the mill building, power plant, smelter feed building, smelter, flux storage building, crusher building, filter building, and miscellaneous structures such as coal-handling facilities and conveyor galleries. ABC started this work early in June, 1953, and completed the steel erection in December, 1953.

Welding, riveting, and bolting were procedures used in fastening the frames. Four Lincoln diesel-powered 300-amp arc welders were used for the welded connections. Riveting was done by four crews using Chicago Pneumatic 210 and 315-cfm compressors. Approximately 70 men were employed in this phase of the work with A. E. Olson taking charge as superintendent for American Bridge.

Produce Concrete

Concrete for virtually everything except the smelter stack was produced under a major subcontract by The Hoyle-Newberg Co., Iron Mountain, Mich. The batch plant was set up near the plant entrance and adjacent to the railroad spur, where it was convenient to haul to both the plant site and the town site. The Butler batching plant consists of a cement elevator and storage tank with under-track hopper and screw conveyor for unloading bulk cement cars. The 3-compartment bin, which holds 30 cubic yards of aggregate, is charged by a Manitowoc 1500 Speedcrane with a 70-foot boom using an Erie one-yard clamshell bucket.

Aggregate, cement, and water are weighed in batches and discharged directly into Rex 5½-cubic-yard mixers mounted on International L-190 tandem-axle trucks. Five of these truck mixers deliver the concrete to the job.

Sand and gravel aggregate are produced by a crushing and washing plant located in a pit near Merensco, Mich., about 30 miles from the plant. Ford trucks with semitrailer dump bodies haul the material to the plant in 12½-ton loads.

When continuous pours were being made using the slip forms on the cylindrical structures, the concrete plant produced as much as 826 cubic yards of concrete in a day. On conventional type pours, production runs from 400 to 500 yards per 8 or 10-hour day.

The Hoyle-Newberg Co. is a joint venture of the Robert C. Hoyle Co., Iron Mountain, Mich., and Gust K. Newberg Construction Co., Chicago, Ill. John Sikorsky is foreman at

the White Pine batch plant.

Crushed rock for road surfacing and other uses was produced in a quarry about two miles from the plant site by Thornton Construction Co., Hancock, Mich. A Link-Belt K360 shovel loaded the blasted rock into trucks which hauled to the crusher. The Cedarapids jaw crusher reduced the sandstone material to usable size in a single pass.

Modern Community

The town site is being rapidly transformed from a dense forest to a completely modern city. Approximately 400 homes will ultimately be built, with six basic designs. All houses have electricity, sewer and

water facilities, radiant heating in floor slabs, and hot-water heaters. Two or more apartment buildings with 22 units per building will be supplied for the use of couples without children. A dormitory houses single men.

Stores and services will be grouped in a conveniently located shopping arcade. Both elementary and high schools are included in the construction plan, as well as a 20-bed hospital, and a municipal center with provision for police and fire departments, a post office, and other facilities.

Planning of the town as well as of the non-process buildings of the industrial area was done by Pace


Associates, Chicago, Ill. Herman Gundlach, Inc., Houghton, Mich., was the contractor for most of the town site building construction.

Major subcontractors on the project in addition to those previously mentioned include Anderson & Cherne, mechanical; McDonald Engineering Co., concrete silos; Dingle Clark Co., electrical; Charles F. Smith & Son, Dayton, Ohio, water pipeline; Bates & Rogers Construction Corp., Chicago, excavation.

Personnel

The president of the White Pine Copper Co. is Morris F. LaCroix. Manager of the project is Harold B. Ewoldt, a vice president of the com-

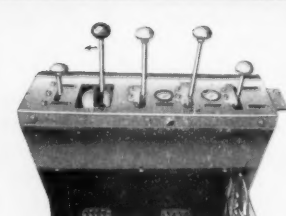
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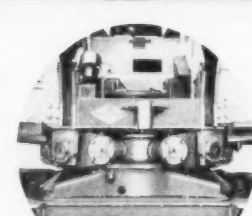
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FOR MAXIMUM STABILITY . . . Crawlers are extra wide and long.

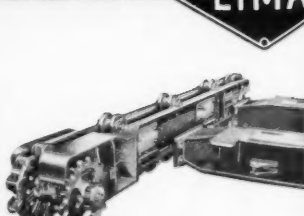
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3-WAY COMPENSATING VALVE
Loads can be snubbed or held in position through a compensating control valve, which permits simultaneous swing clutch and swing brake operation.



CONICAL HOOK TYPE ROLLERS
Weight is evenly distributed on the roller paths through six hook type conical rollers, four in front and two in the rear.



REMOVABLE SIDE FRAMES
Crawler side frames can be removed to meet most highway weight limitations when it is necessary to trail machine, or to keep within certain rail clearances.



CONTRACTORS AND ENGINEERS

pany. Resident project manager for Turner Construction Co., the prime contractor, is G. M. Reaves. He is assisted by M. J. Hinkley, project engineer; W. R. C. Wood, construction general superintendent, and W. R. Herring, purchasing agent.

Turner Construction Co. sublet design of the power plant to Stone & Webster Engineering Corp., New York; the town site to Pace Associates; and the mine, mill, and smelter to Western-Knapp Engineering Co. Approximately 1,200 employees worked on the construction during the maximum employment periods.

THE END

Remember the blood bank today!

U. S. Geological Survey Lets Drilling Contracts

The United States Geological Survey, Denver, Colo., has awarded two separate contracts for diamond drilling in the uranium fields of the Colorado plateau area. One contract covers an extension of exploratory drilling at La Sal Creek Area No. 2, Montrose County, Colo., and San Juan County, Utah, totaling 60,000 linear feet. A similar contract was awarded for additional exploratory drilling on the Gateway No. 2, or Beaver Mesa area, project in Mesa County, Colo., and Grand County, Utah.

Both contracts have gone to

Sprague & Henwood, Inc., Scranton, Pa., manufacturer of diamond drilling machines, diamond bits, and equipment for drilling and soil sampling.

Lufkin Representative

Representing The Lufkin Rule Co. in Colorado and several neighboring states is Richard Colvin, who makes his headquarters in Denver. The arrangement has been made by the company in order to serve the Mountain States more effectively. The Lufkin Rule Co., Saginaw, Mich., manufactures instruments and supplies for surveyors and engineers.

CONVENTION CALENDAR

June 9-12 National Assn. of County Officials Eighteenth Annual Conference and Highway Exposition, National Association of County Officials, Ak-Sar-Ben Coliseum, Omaha, Nebr. Keith L. Seegmiller, secretary-treasurer, 1616 Eye St., Washington, D. C.

June 9-12 National Society of Professional Engineers

Twentieth Annual Meeting, National Society of Professional Engineers, Schroeder Hotel, Milwaukee, Wis. Kenneth E. Trombley, NSPE, 1121 15th St. N. W., Washington 5, D. C.

June 13-18 American Society for Testing Materials

Annual Meeting and Exhibit, American Society for Testing Materials, Sherman and Morrison Hotels, Chicago, Ill. G. A. Wilson, senior assistant editor, ASTM, 1916 Race St., Philadelphia, Pa.

June 15-18 American Society of Civil Engineers

Meeting, American Society of Civil Engineers, Hotel Chalfonte-Haddon Hall, Atlantic City, N. J. Don P. Reynolds, assistant to the secretary, ASCE, 33 W. 39th St., New York 18, N. Y.

June 21-23 Conference on Thin Concrete Shells

Conference on Thin Concrete Shells, Massachusetts Institute of Technology, Cambridge, Mass. Summer Session Office, Room 7-103, MIT, Cambridge, Mass.

June 28-30 American Society of Landscape Architects

Meeting, American Society of Landscape Architects, Hotel Somerset, Boston, Mass. Bradford Williams, corresponding secretary, ASLA, 9 Park St., Boston 8, Mass.

New York Thruway to Open First Section This Month

On June 24, the first stretch of the New York State Thruway—120 miles of road between Route 15 south of Rochester and Route 233 at Westmoreland—will be opened as Governor Thomas E. Dewey cuts a ribbon at the Westmoreland end of the road. After the official inspection party travels over the highway to the Route 15 interchange, Governor Dewey will actuate a signal officially opening each interchange to thruway traffic. Speed limits and toll charges, already established, will go into effect immediately.

Additional stretches of road will be opened to traffic as they are finished. This year, the initial toll section connecting Buffalo, Albany, and the vicinity near the New Jersey state line will be opened. By next summer, the entire 427-mile main section from Buffalo to New York City will be in use.

The maximum speed limit on the highway is 60 miles per hour for passenger cars and 50 miles per hour for trucks and buses. The lower limit for commercial vehicles was adopted by the Thruway Authority following conferences held earlier with representatives of the trucking industry.

The toll schedule for the road has been computed on the basis of about 1¼ cents per mile for passenger vehicles, 1¼ to 5 cents per mile for trucks of various sizes, and 3½ cents a mile for buses. A total of 37 toll-booth facilities will be located on the completed thruway to handle toll collections by means of what has been termed a "fraud-proof" system. (See "Thruway Calculators Will Prevent Delays", C. & E., December, 1953, pg. 90.)

Type 703-SC 50 TON CRANE with extra stability and easy portability

The new LIMA Type 703-SC is designed to give you unequalled crane performance for tough lifting jobs. Each part is engineered to meet the most rigorous operating requirements.

Even more important to you . . . Lima's long experience producing the very finest construction equipment is responsible for these important *bonus benefits* with the Lima Type 703-SC:

Greater Stability — Extra-wide, extra-long, heavy duty crawlers insure maximum stability at all times. The result is greater load capacity.

Unequalled Portability — The Type 703-SC is designed with portability in mind. Its removable side

frames are an important factor in transporting it over state highways having weight limitations. The Type 703-SC is also available with wagon or truck mounting to provide maximum mobility with minimum travel time between jobs. Wagon mounted crane is powered by one engine—including travel—with one operator. Truck mounted crane requires two engines; one for travel and one for operating machinery.

Investigate the outstanding performance you can get from the Lima Type 703-SC 50 ton crane. Send today for Bulletin No. 73-SC-A which gives full details—specifications, operating capacities, etc.—or call your nearby Lima distributor.

COMPARE! No other machine gives you as much as LIMA!

1. Bronze bushings in tread, idler and drive rollers are protected by piston-ring type dirt seal rings and retainers.
2. All gears, smaller parts and shafts which are subject to extra wear are flame or induction hardened for longer life.
3. Main machinery is placed well back of center of rotation to eliminate excess counterweight.
4. Anti-friction bearings, used at all important bearing points, reduce destructive friction, fuel consumption and lubrication requirements.
5. Big capacity drums and sheaves lengthen cable life by reducing the need for double wrapping and sharp bends in cable.
6. Machine cut propel and swing gears and roller chain power takeoff are enclosed in a sealed oil bath for dirt elimination and smoother, quieter operation.
7. Crawler side frame assemblies are easily removed to comply with most highway limitations when trailing machine from job to job.
8. Full air controls on travel, hoist, swing and boom hoist, result in smoother, more precise operation, minimum maintenance and less operator fatigue.

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Hydro Dams Planned By New Power Venture

An ambitious \$300,000,000 to \$500,000,000 construction program in the field of hydroelectric power development is being mapped by officials of the Pacific Northwest Power Co., a new firm formed by five private utilities companies in the Pacific Northwest. The new enterprise is incorporated at Salem, Oreg.

Already the new firm has applied to the Federal Power Commission for a permit to explore two proposed projects on branches of the Clearwater River in northwestern Idaho. The sites are at Bruces Eddy and Penny Cliffs, and initial estimates indicate that 536,000 kilowatts of power could be brought in at a development cost of \$300,000,000. Engineering companies have been con-

ducting investigations on the proposed Clearwater projects.

Officials of the new firm emphasize that the development venture will in no way change the independent operations of the five participating companies. Sole function of the new enterprise is to develop future power supplied for the individual systems of the cooperating utilities.

The five companies together serve about 50 per cent of all power users in Oregon, Washington, northern Idaho, and Montana. The companies have a combined generating capacity of 1,400,000 kilowatts, but estimate a joint need for 150,000 to 200,000 kilowatts of new plant capacity annually with which to meet the growing demand for power in the area.

The president of the new firm is

Kinsey M. Robinson, president of the Washington Water Power Co. Vice presidents and the firms they represent include: J. E. Corette, president of Montana Power Co.; Paul B. McKee, president of Pacific Power & Light Co.; T. W. Delzell, chairman of the board of Portland General Electric Co.; A. W. Trimble, president of Montana States Power Co.

The proposed developments are among nearly a dozen for which application has been made to the FPC and which, if approved, will provide 3,500,000 kilowatts of power at a cost of a billion dollars. Contractors in the northwest and elsewhere in the country are watching the development plans carefully since they represent sizeable construction programs which would carry over for many years.

Truck Tire Features New Body and Tread

■ A truck tire said to increase traction and tread life is announced by Goodyear Tire & Rubber Co., Akron 16, Ohio. Called the Traction Hi-Miler, the tire has a new body and tread and is available in either all-nylon or rayon cord. The tread has five zigzag ribs and deep stop-notches for greater skid-resistance. The stop-notch feature is the first of its kind in a truck tire, according to the company. Because the new tire is flatter and places more rubber on the road than standard tires, it also offers longer and more even wear.

The tire has been made still more heat and bruise-resistant by an exclusive process which tempers the cord to control its stretch. The process also controls tire "growth" and practically eliminates tread cracking, the company states, thus prolonging the life of the tire carcass and allowing for more recaps.

For further information write to the company, or use the Request Card at page 18. Circle No. 522.

More Road Construction Is Planned In Turkey

Increased construction of farm-to-market roads in Turkey is today beginning to fill a pressing need in this predominantly agricultural country. Although favoring the construction of fewer and higher type roads, according to K. E. McConnaughay, of Lafayette, Ind., manufacturer of bituminous road products, Turkey is now following the recommendations of the U. S. Bureau of Public Roads and constructing these arteries of either heavy gravel or stone. Most of the surfacing will be done later.

Road-building recommendations made by some other engineering organizations have not turned out too well in Turkey, reports Mr. McConnaughay, who was in the country recently to study road-building methods. He feels that advice on road construction should come from engineers of state highway departments or the Bureau of Public Roads.

Turkey is importing asphalt in bulk for its road-construction program, and several tank cars have been assembled to transport the material. Storage units for asphalt are also being built at several points. If cutback is used, the asphalt and solvent are combined in the country. Tar available, according to the asphalt plant and heater manufacturer, seems to be of fair quality.

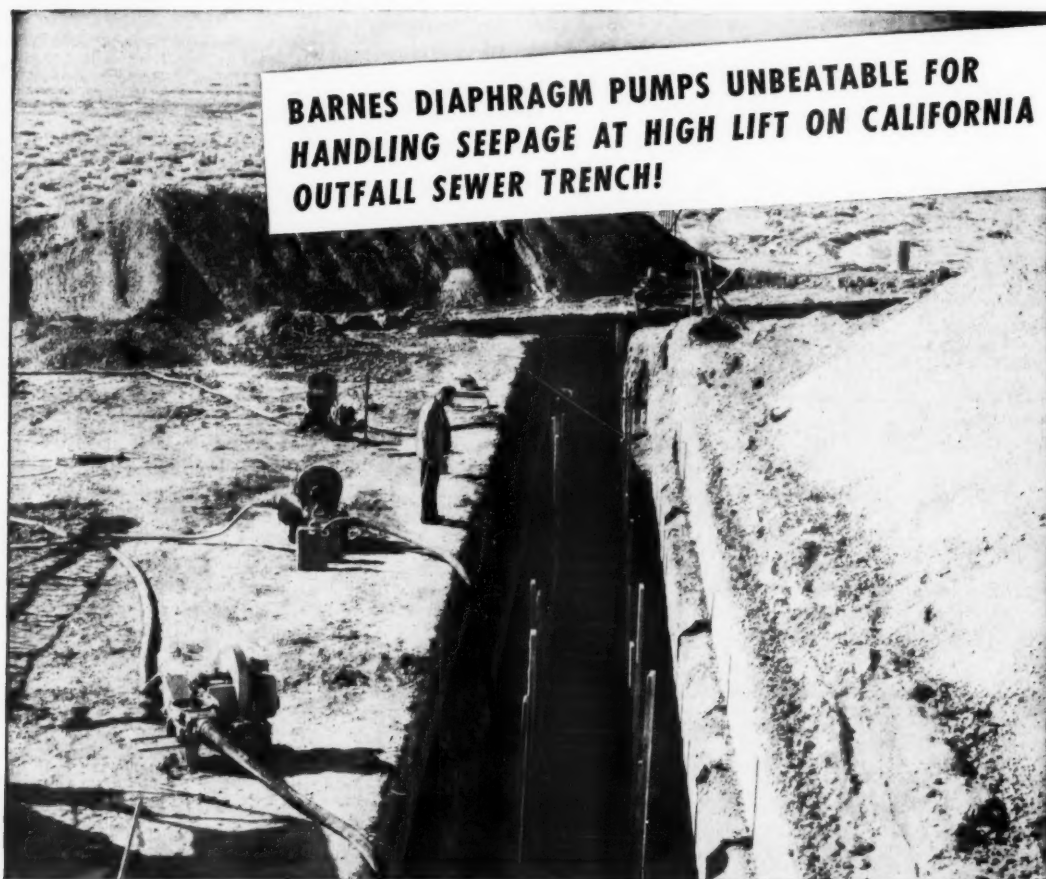
Literature on Scaffolds

■ A new brochure illustrating steel and aluminum scaffolds for building construction and repair has been released by the Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City 1, N. Y.

Bulletin G-206R shows by pictures and text how the company's Trouble Saver sectional scaffolding is used by contractors for bricklaying, plastering, and shoring. The equipment is also shown being used in rolling scaffolds and hoisting towers.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 630.

BARNES DIAPHRAGM PUMPS UNBEATABLE FOR HANDLING SEEPAGE AT HIGH LIFT ON CALIFORNIA OUTFALL SEWER TRENCH!

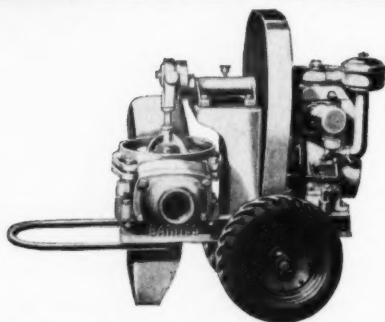


Step-down berm construction of the 14½-foot-deep sewer ditch on the Vukich-Brown outfall sewer job for Lancaster, California. Barnes Diaphragm Pumps work day and night to keep lower 10½ feet dry as pipe is installed.

Running 24-inch concrete sewer outfall across the Mojave Desert for the City of Lancaster, Calif., contractors Vukich and Brown used an interesting step-down berm construction of the 14½-foot-deep sewer ditch, which took away the super-imposed overhead load and reduced trench bracing.

With the prevailing ground water level only 4 ft. beneath the desert floor, water seepage proved a constant threat. This problem was neatly, surely, and economically solved by using three Barnes 3-in. Diaphragm Pumps. Working day and night, these pumps handled up to 45,000 gallons of water per hour—kept the lower 10½ feet of ditch dry and permitted pipe to be laid on schedule.

Contractor Paul Vukich says, "These Barnes Pumps are the best made for our work. They're absolutely dependable. They run 24 hours a day at low cost, with a minimum of trouble. This is a high pump lift; but our Barnes Pumps are doing their job!"



BARNES BC 402 DIAPHRAGM PUMP

Ideal for handling seepage water. This is but one of the many pumps in the complete Barnes Line, with capacities up to 120,000 G.P.H. and pressures up to 600 ft. or 260 P.S.I.

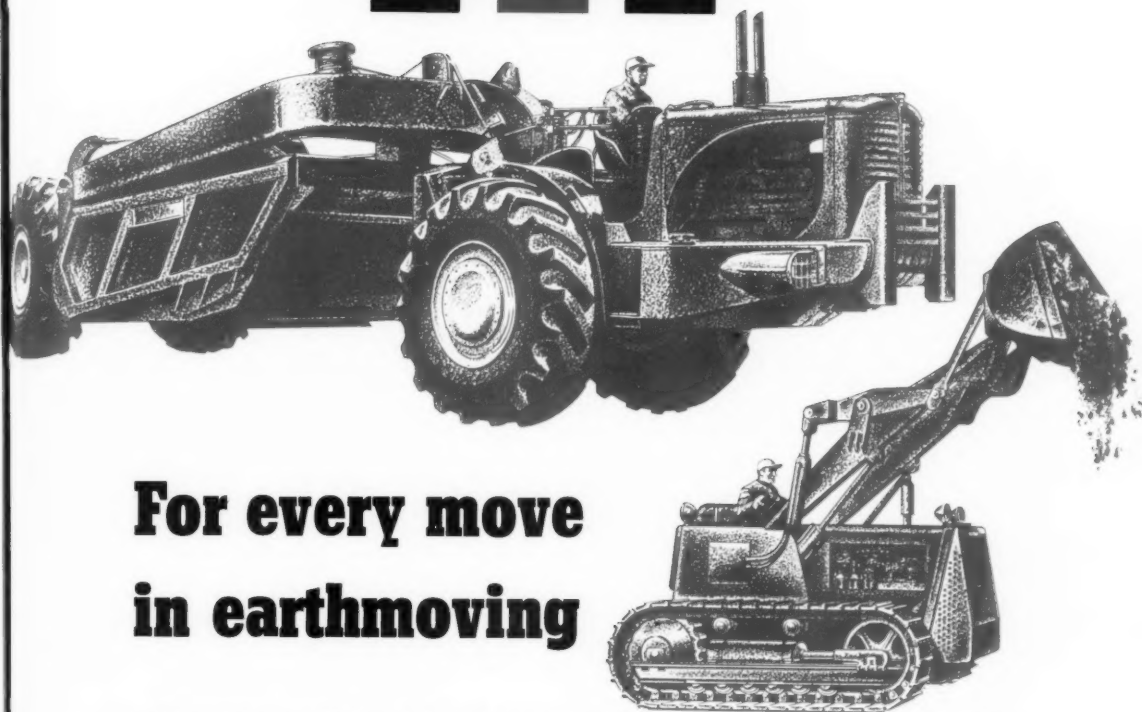
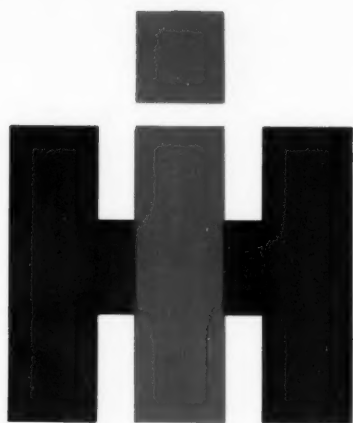
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For every move in earthmoving

INTERNATIONAL Industrial Distributors are your headquarters for the complete INTERNATIONAL line of modern earthmoving equipment, led by the INTERNATIONAL TD-24, world's most powerful crawler, and by the INTERNATIONAL two-wheel, rubber-tired tractors with scrapers and bottom dump wagon.

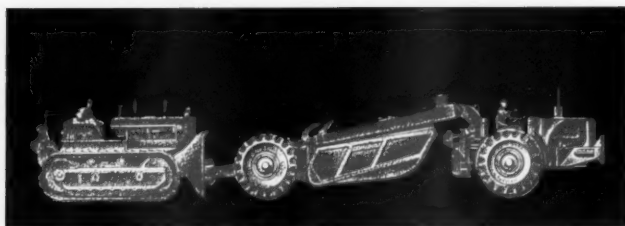
For proof of INTERNATIONAL performance, call your INTERNATIONAL Industrial Distributor today. Get the low-down on low-cost earthmoving on your own job—with a demonstration whenever you say.

**MAKES EVERY LOAD
A PAYLOAD**



INTERNATIONAL®

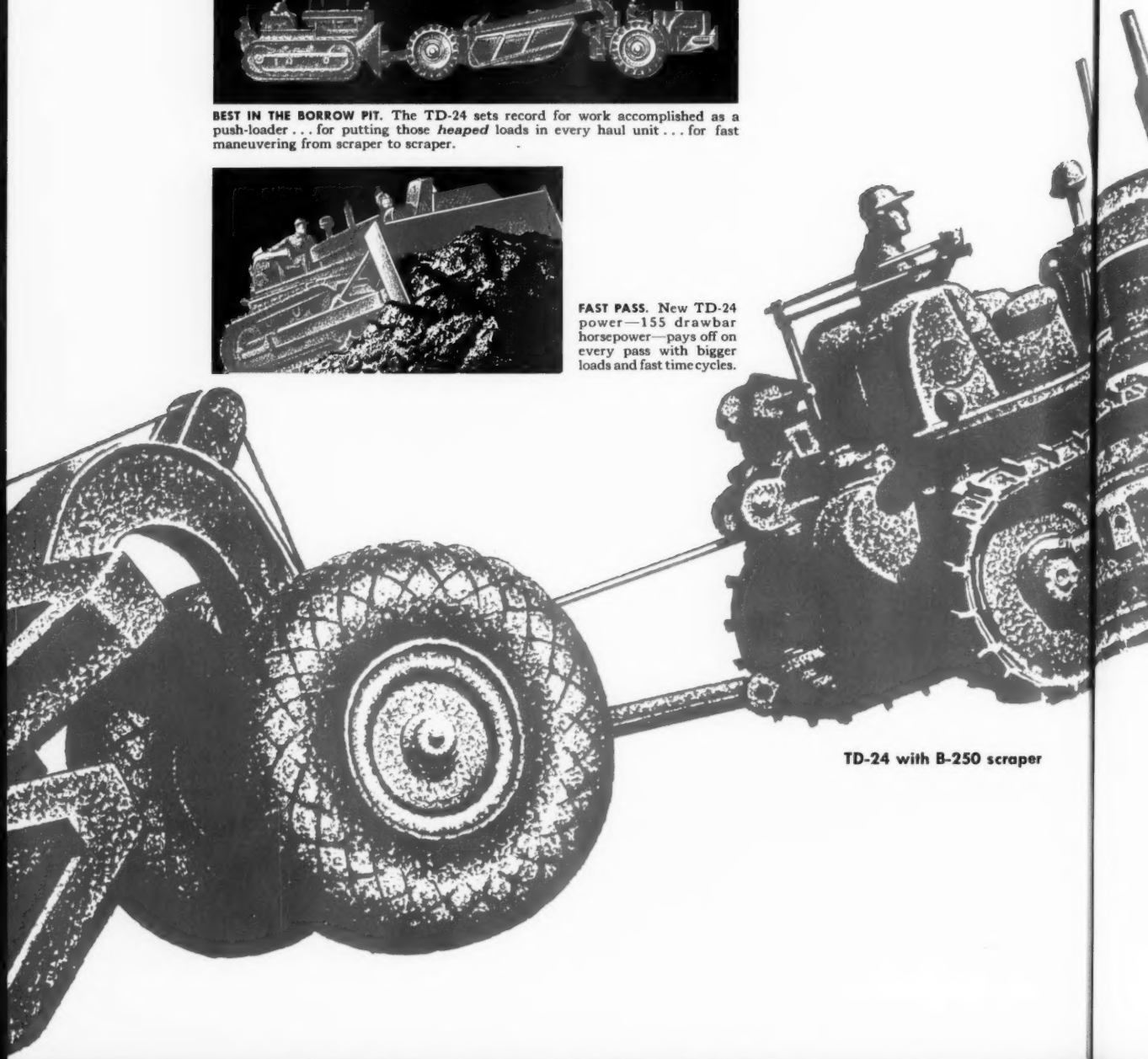
The Champ is S



BEST IN THE BORROW PIT. The TD-24 sets record for work accomplished as a push-loader... for putting those *heaped* loads in every haul unit... for fast maneuvering from scraper to scraper.



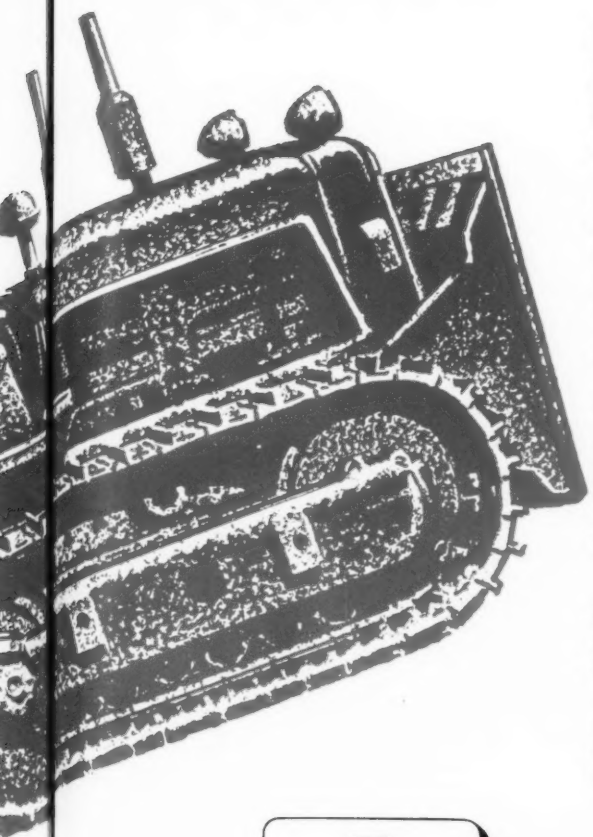
FAST PASS. New TD-24 power—155 drawbar horsepower—pays off on every pass with bigger loads and fast time cycles.



TD-24 with B-250 scraper

Still CHAMP

**INTERNATIONAL TD-24 crawler at 155 drawbar horsepower
heads a complete equipment line for every move in earthmoving**



Now International steps up the power of the most powerful crawler in the world! The TD-24, "The Champ" of crawler power now packs even higher work rating—155 maximum drawbar horsepower.

"The Champ" has been setting performance standards for years with its production-boosting combination of power, speed and stamina. It heads this complete INTERNATIONAL equipment lineup for every move in earthmoving:

- Seven rugged crawlers, led by the INTERNATIONAL TD-24.
- Twenty-two matching hydraulic and cable-controlled bulldozers and BULLGRADER® angling dozers.
- Four 4-wheel scrapers.
- Two high-speed, two-wheel, rubber-tired tractors with scrapers (13 and 18-yard heaped capacity).
- A high-speed, two-wheel, rubber-tired tractor with bottom dump wagon (20-yard heaped capacity).
- Five front-end loaders, for the TD-6 through the TD-18A—tops for speedy break-out and loading of all types of materials.

On tracks—on rubber—INTERNATIONAL power and equipment make the hardest-working work teams in the world.

Call your INTERNATIONAL Industrial Distributor for full details on the *complete* line of INTERNATIONAL earthmoving equipment . . . and for on-your-job demonstrations.

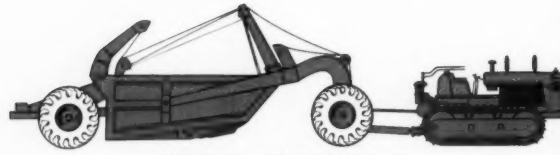


INTERNATIONAL

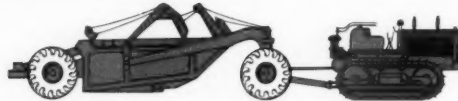
MAKES EVERY LOAD A PAYLOAD

Now All in One Family

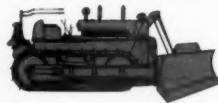
the hardest-working work teams in the world!



TD-24 crawler with matched scrapers



TD-18A crawler with matched scrapers



TD-24 crawler with BULLGRADER



TD-14A crawler with cable BULLGRADER



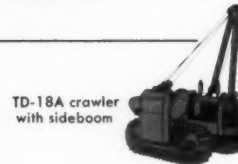
TD-9 crawler with hydraulic bulldozer



TD-9 crawler with front-end loader



TD-6 crawler with hydraulic bulldozer



TD-18A crawler with sideboom



Model 2T-75 two-wheel, rubber-tired tractor with 18-yard heaped capacity scraper



Model 2T-75 two-wheel, rubber-tired tractor with 20-yard heaped capacity bottom dump wagon



Model 2T-55 two-wheel, rubber-tired tractor with 13-yard heaped capacity scraper



INTERNATIONAL®

MAKES EVERY LOAD A PAYLOAD



New Backfill Tampers

■ Two new backfill tampers are announced by the Davey Compressor Co., N. Water St., Kent, Ohio.

The Model DT-32 is in the medium-weight class. Its net weight is 35 pounds, and its length is 47½ inches. Maximum body diameter is 3 inches, and butt diameter is 6 inches.

The second model, the DT-42, has more than double the work capacity of medium-weight tampers. It weighs 45 pounds, and its length is 47½ inches. Maximum body diameter is 3¾ inches, and the butt diameter is 6 inches.

For further information write to the company, or use the Request Card at page 18. Circle No. 631.

Wide Line of Equipment For Heavy Construction

■ The principal construction equipment manufactured by Pettibone and its subsidiaries—Universal Engineering, Haiss, Pettibone Wood, and Hammermills—is presented in a new booklet.

The wide variety of equipment described includes power graders, front-end loaders, and swing loaders and cranes. In addition, self-feeding self-propelled conveyor-type loaders are offered in wheel, crawler, and truck-mounted machines with a variety of feeds and conveyors.

A large line of crushing, screening, and loading equipment is also illustrated. It includes complete rock and gravel plants, jaw crushers and roll crushers, impact breakers, hammermills, screens, scrubbers, and manganese replacement parts for many of these units.

Among other products shown are excavating buckets and dippers, portable conveyors, and sand and gravel pumps. Also covered is the Pettibone Wood mix-in-place road-building equipment, including the Roadmixer, a road-mix machine, and the Preparizer, which scarifies and pulverizes pavement for re-use.

To obtain this literature write to the Pettibone Mulliken Corp., 4700 W. Division St., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 632.

Engineering Income Is Listed In Report

Information on the professional income of about 72,000 engineers in industry, government, and engineering education is contained in "Professional Income of Engineers, 1953", published by the special surveys committee of the Engineers Joint Council. The report covers about 22 per cent of those estimated to be employed in industry or education. Data presented is related to the year in which the individual received his first degree in engineering.

The income of engineers in industry has been classified by type of industry rather than by engineering specialties, as has been the practice in previous surveys. For those in engineering education, the statistics include income from engineering

work as well as from teaching.

This report may be obtained from EJC, 29 W. 39th St., New York 18, N. Y., at \$2 per copy. Members of constituent societies of EJC can obtain single copies at a 50 per cent discount.

Timber Construction Film

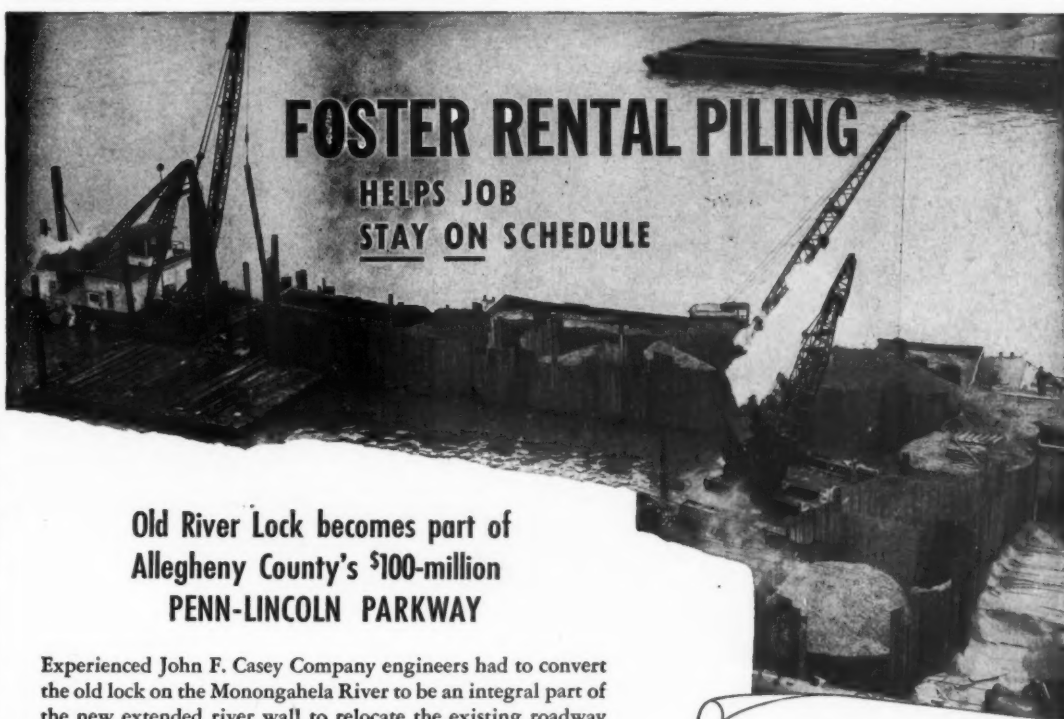
Research on wood product developments and engineered timber construction are featured in a film, "Coming Out of the Woods", which has been released by Timber Engineering Co. The research affiliate of the National Lumber Manufacturers Association is making the picture available for showings to professional and industrial organizations.

While dealing primarily with lumber and wood product research at the TECO laboratory, including tests

of timber connectors, full-scale trusses, and trussed rafters, the film also provides background information on wood as structural and industrial product material. Prints can be obtained on loan and without charge from The Bray Studios, Inc., 729 7th Ave., New York 19, N. Y.

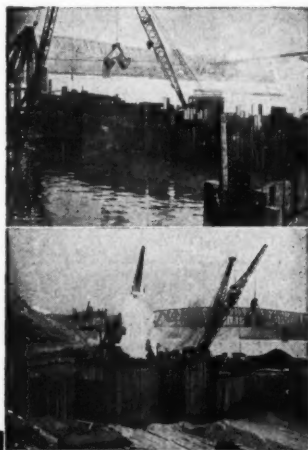
Representative for Athey

H. S. Jones, newly appointed district representative for Athey Products Corp., Chicago, has taken up headquarters in Cleveland, Ohio. He will work on sales and market development with Athey distributors in Ohio, Indiana, Pennsylvania, Michigan, and parts of Kentucky, West Virginia, and Canada. Mr. Jones previously worked with various machine manufacturers in the design and sales fields.



Old River Lock becomes part of Allegheny County's \$100-million PENN-LINCOLN PARKWAY

Experienced John F. Casey Company engineers had to convert the old lock on the Monongahela River to be an integral part of the new extended river wall to relocate the existing roadway and accommodate the new Penn-Lincoln Parkway. Casey engineers drove cellular cofferdams averaging 23'9" in diameter to keep water seepage to the minimum on this tremendous engineering project. Their careful planning insured an efficient, uninterrupted work schedule in constructing the river wall, and an important part of the schedule depended on Rental steel-sheet Piling from Foster. Foster delivered ahead of schedule, in the exact sections (MP-112) and in the specified lengths.



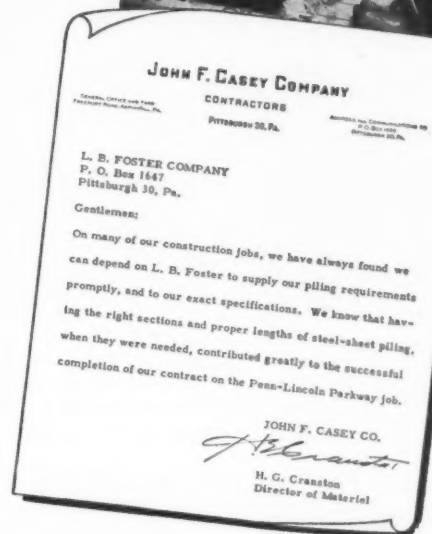
On your next Piling job, call Foster for the exact sections, in the exact lengths... on the job when you need it, and at Foster's standard low rental rates that allow considerable saving.

NEW PILING CATALOG
Just Released!

Describes steel-sheet Piling Sections and construction data. Ask your nearest Foster office for Catalog CE-6.

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RAILS · SWITCH MATERIAL
TRACK ACCESSORIES, TOOLS
PIPE AND FABRICATION
WIRE ROPE AND SLINGS

YOU SAVE WHEN YOU RENT STEEL-SHEET PILING FROM FOSTER



An Allis-Chalmers HD-15 tractor with Baker dozer follows the pipe-laying crew to straighten up the right-of-way. Charles F. Smith & Son, Inc., Dayton, Ohio, performed this work for the White Pine construction project.

C&E Staff Photo

Water System Is Built for Town and Plant

TO BRING WATER to the White Pine processing plant at a rate of about 15,000 gpm, a water system is being built which will also be capable of supplying the White Pine mine and adjacent community.

Water, entering an intake structure at the bottom of Lake Superior about a half mile offshore, will flow through a tunnel deep under the lake bottom to a pumping station on shore, where it will be carried to

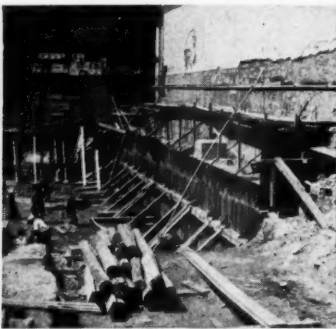
the plant and town through a 36-inch pipeline. Most of the water piped to the plant will be used in the milling operations. Used water from the plant will be collected below the tailings dam and returned to the mill for re-use. Sewage from the town and the plant will go through a sewage-treatment plant before being discharged into the stream.

Construction of this system was handled by Turner Construction Co., New York, N. Y., prime contractor. The inlet structure at the bottom of Lake Superior was built by Zenith Dredge Co., Duluth, Minn., and the tunnel from the inlet to the pumping station, together with the pumping station itself, was constructed by the Turner organization. Charles F. Smith & Son, Inc., Dayton, Ohio, laid the pipeline from the pumping station to White Pine.

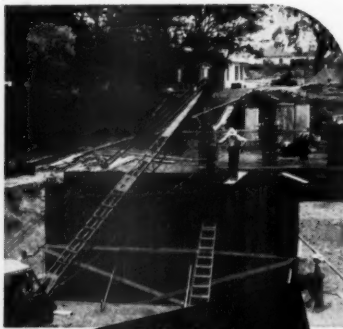
The tunnel was excavated in dry shale and sandstone. It lies 45 feet below the solid rock floor of the lake at the point where it meets the intake structure, which is about 2,600 feet out from shore. The inlet structure consists of a grated cover over a ring, 12 feet in diameter, which projects up 5 feet from the floor of the lake. Since the water at this point is approximately 27 feet deep, the inlet structure will be submerged under 22 feet of water. The contractor had to build the inlet so that it would connect to a vertical shaft at the end of the tunnel.



Pier Foundation Forms



Retaining Walls



Cofferdam

Armco Sheet piling does so many jobs so well



Shaft Lining



Trench Sheet piling



Ditch Checks

It can be one of your *most versatile* tools! Where you have a problem of controlling soil or water, Armco Steel Sheet piling can often provide an economical solution.

The light weight and small displacement of Armco Sheet piling make handling and driving easier. Either hand maul or power hammer may be used. And on temporary jobs, a small hole at the top of each section simplifies pulling. You can drive this durable sheet piling time and time again, cutting unit costs with each re-use.

ARMCO FLANGE TYPE SHEETING is 12 inches

wide and is available in 12, 10, 8, 7, 5, and 3 gage.

ARMCO INTERLOCKING SHEETING, used for practical watertightness, has a covering width of 14 inches and is made in 12, 10, 8, and 7 gage. Both types are supplied in standard lengths up to 20 feet.

Write us for more information on versatile Armco Steel Sheet piling. Armco Drainage & Metal Products, Inc., 2384 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

Armco Steel Sheet piling



Divers Build Inlet

Work on the inlet structure was primarily a job for two divers, who operated from the Zenith Company's floating platform. The small crowded platform was supported on three cylindrical pontoons. In addition to the diving equipment, the float carried a 6-drum Clyde winch powered by a Wisconsin engine, a 105-cfm Ingersoll-Rand air compressor, a 3-inch Gorman-Rupp pump, and a generous supply of rope, cable, and miscellaneous tools. An A-frame on one end of the float was utilized to lift and handle heavy articles. Cables running to the four 500-pound anchors were handled by the winch.

The divers alternated, one manning the diving equipment on the float while the other worked on the lake bottom. Their first operation was to level an area on the lake floor before the base ring for the structure was set.

2 H.P. UNIVERSAL ELECTRIC MOTOR VIBRATOR

Place Concrete faster! Light - Powerful

\$297.00 UP

FOR CATALOG WYCO GASOLINE AND ELECTRIC VIBRATORS

WYZENBEEK & STAFF, INC.

223 N. CALIFORNIA AVE. CHICAGO, ILLINOIS

CONTRACTORS AND ENGINEERS

**Lake inlet, 2,600-foot tunnel to pumping station
on shore, and 36-inch concrete pipeline will
supply new development**

Where it was necessary to blast the sandstone bottom, holes were drilled with Ingersoll-Rand and Gardner-Denver 50-pound rock drills. Then they were loaded with heavy charges of Atlas 40 per cent gelatine and detonated electrically. Loose material was removed from the area by hand or jetted away with a stream from the Gorman-Rupp pump.

Following this, two concentric rings—an inner ring 14 feet in diameter and an outer ring 30 feet in diameter—were set on the lake bottom. Spoke-like braces tied the rings into a rigid structure. A steel caisson 12 feet in diameter, set inside the inner ring, rested on the lake bottom so that part of it projected above the surface of the water. Because of the strong currents in Lake Superior, dowl pins were set into the rock around the structure, and the caisson was guyed with cables attached to these pins. This entire structure was set as a unit.

With the caisson in place, a 200-cubic-yard collar of concrete was cast around the base, enveloping the base rings. The concrete was mixed on a barge and placed from the surface by means of tremies. This collar anchors the structure to the lake bottom and seals out water.

The caisson was then dewatered. Inside it, a 5-foot-square shaft was sunk 12 feet into the rock of the lake bed. Completing the structure, workmen placed a grating over the opening, then removed that part of the caisson above the finished structure. A watertight cover was then placed over the grated opening by divers.

When the tunnel had been excavated to a point directly under the outlet structure, a vertical shaft was raised upward to the dry chamber of the inlet structure. With the shaft and tunnel complete, all construction equipment was removed from the units, and a diver was sent down to remove the solid cover from the inlet, permitting lake water to flow into the tunnel.

Construction of the inlet structure was supervised by Tom O'Day for Zenith Dredge Co., and William Jarvi and Dick Klapper were the divers.

Lake Intake Tunnel

One end of the inlet tunnel is a vertical shaft, located on shore near

the mouth of the Iron River. It is 7 x 13 feet in section, and 100 feet deep, and it extends through 85 feet of solid shale and sandstone below 15 feet of red clay.

At its bottom is the tunnel section, 6 feet wide and 7 feet high, extending horizontally 2,600 feet under the lake floor. The grade of the tunnel rises 0.5 per cent from the base of the shaft to the inlet. With the ex-

(Continued on next page)



A diver returns to the float after working on the inlet structure at the bottom of Lake Superior. The crowded raft carries a 6-drum Clyde winch powered by a Wisconsin engine, a 105-cfm Ingersoll-Rand air compressor, and a Gorman-Rupp pump. C&E Staff Photo

ATOMIC ENERGY PROJECT MOVES AHEAD WITH GRADALLS!



Gradall's positive down pressure and controlled "arm" and "wrist" action of boom and bucket make it possible to dig straight down inside wooden patterns. No other machine could do this job accurately!

EXCAVATING for the Atomic Energy Commission Project near Portsmouth, Ohio, is moving ahead with Gradalls working on several separate contracts.

Most important of the many jobs handled by the Gradalls is the accurate excavating of many thousands of footer holes for the huge buildings being erected on the site.

These holes, mostly 8 feet square and from 2 to 4 feet deep, must be dug to *exact specifications* with tolerances less than 1/2 inch. (Other holes range from 4 to 11 feet square, to as much as 12 feet deep.) By digging to these exacting "specs" no forms are required inside the holes—pre-built forms are simply fastened down to hold concrete above ground level.

Contractors on the project agree—these holes could not be excavated by any machine other than the Gradall. And hand labor couldn't possibly be used economically to keep up with the schedule of 20 to 40 holes per day (depending on size) handled by each Gradall.

It's the same story on many other jobs—when the work calls for accuracy as well as speed and economy, it's the man with the Gradall who gets the contract!



Dumping height to spare! Digging footers along a rail siding, the Gradall boom reaches up and out to load spoil. Gradalls are used for trenching, road maintenance and many other jobs on this project.

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DIVISION OF WARNER
SWASEY
Cleveland
PRECISION
MACHINERY
SINCE 1886

Gradall Distributors
in over 75 principal cities
in the United States and Canada

**IT'S
HERE**
the
Davis Pit-Bull
SEE AMERICA'S MOST
VERSATILE EQUIPMENT
ON PAGE 6

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

(Continued from preceding page)

ception of surface seepage in the shaft, the first 1,300 feet of the tunnel construction was dry. Later, a number of seams were struck to admit water from the lake above. These were sealed with cement grout, a Gardner-Denver grout pump doing the job.

A single-drum Red Giant hoist, powered by a 100-hp electric motor, is mounted in the headframe of the shaft. During excavation, 16-cubic-foot buckets were loaded by hand, hoisted to the surface, and emptied into waiting trucks. Drilling in the shaft was done with Ingersoll-Rand Jackhammers.

In the tunnel also, drilling was a job for Ingersoll-Rand hammers with I-R Jacklegs and air feed. Material was loaded into buckets by



Superintendent Tom O'Day inspects the Ingersoll-Rand 105 cfm compressor used to operate drilling tools on the lake floor. C&E Staff Photo

two Eimco 12-B Rocker-Shovels with 3-cubic-foot buckets. These machines were operated by two air motors. Air for all purposes was supplied by an Ingersoll-Rand 600-

cfm Gyro-Flo compressor, powered by a Caterpillar 325-kva diesel generator.

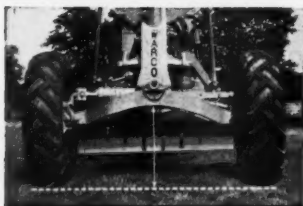
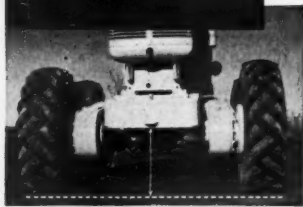
Transportation within the tunnel was handled by a single-track nar-

row-gage railroad. A Mancha-Titan A 3-ton battery-operated locomotive pulled trains of ten cars, with each car carrying one 16-cubic-foot bucket. A Canton car transfer moved the empties to a sidetrack. The buckets were loaded with rock by the Eimco loader, hauled to the shaft, and hoisted to the surface where the excavated material was hauled away in dump trucks.

Since the tunnel is well below the level of the lake, it will always be filled with water. Below water level in the pumphouse are three pumps, each with a capacity of 6,000 gpm. These pumps will force water through a 36-inch pipeline to the plant site. There, pressure will be maintained by overhead storage tanks. Domestic water for the city will be treated in a purification plant before it enters the city mains.



a
WARCO
angle
on
"dead-
heading"



Yes, it's an angle you don't often see pictured... quite a change from the usual imposing front view. But with it, we can drive home a few points we'd like to make... and we'll back up our statements as effectively as we can back up our grader.

ONLY WITH A WARCO can back-up passes be accomplished so easily, so productively. When you're working in close quarters, with no turn-around space... don't "dead-head" back. In less than a minute, the WARCO blade can be swung 180° entirely by hydraulic control from the cab... and you're ready to make a productive back-up pass. In fact, any WARCO blade position can be secured hydraulically without the operator leaving the cab to make any manual adjustment of linkages.

ONLY WITH A WARCO can so much valuable working time be saved... through complete hydraulic control.

The WARCO tandem drive provides extra transmission height and working clearance under raised driving axle.

High arch of front end straddles a very high windrow... 30 full inches with 4D-115 and 29 inches with 4D-85... No bulldozing with front axle.

W. A. RIDDELL Corp.

BUYRUS, OHIO U. S. A.

Builders of WARCO Motor Graders and HERCULES Road Rollers

WARCO MOTOR GRADERS : MODEL 4D-115 HEAVY DUTY 115 HP : MODEL 4D-85 MEDIUM DUTY 85 HP

NEW CONDENSED HANDBOOK

for faster concrete handling and placing...

THE NEWEST METHODS for handling and placing concrete are condensed into this 56-page, pocket-sized booklet. It covers all phases of construction methods. Lists available current technical data... includes useful tables... illustrates correct and incorrect methods... shows unusual jobs and how they were solved... and many other important facts.

This manual also has equipment references and complete check lists of job specs, job conditions and equipment.

It's the kind of book any concrete man can use every working day; ask for your copy at your Gar-Bro dealer's or write today!



THE WORLD'S MOST COMPLETE LINE OF CONCRETE HANDLING EQUIPMENT

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General Offices: 2415 E. Washington Blvd. • Los Angeles 21, Calif.



CONTRACTORS AND ENGINEERS

In charge of this work for Turner was C. A. Miller.

Laying Pipeline

Laying 6 miles of 36-inch pipeline to connect the pumping station and mine site, a job supervised by Chester Jeska for Charles F. Smith & Son, was done through heavily wooded country. Since the White Pine site lies about 250 feet above lake level, the grade is uphill almost from the pumping station.

Hand crews cleared the 50-foot right-of-way of trees and brush with axes and chain saws. Merchantable timber was salvaged, and brush was burned. An Allis-Chalmers HD-15 tractor with dozer followed the clearing crews, grubbing stumps and removing humus and topsoil to permit the red clay soil to dry.

The reinforced-concrete pipe, manufactured by Price Bros., Dayton, Ohio, was shipped to the job by rail. The 16-foot sections were unloaded at the mine siding by a Browning 20-ton truck crane, loaded on logging trucks, and then strung out along the right-of-way. Because of the soft wet condition of the clay soil on the right-of-way and access roads, it was necessary to pull the trucks in and out with a Caterpillar D4 tractor.

Trenching was done by a Northwest 95 2-yard pull shovel. This machine also lowered the pipe into the trench. The tongue-and-groove pipe joints were sealed with rubber gaskets, the remaining annular space filled with cement mortar, and a paper wrapping placed around the outside.

Select material from the excavation was carefully tamped around the pipe by hand. The remainder of the trench was filled by an Allis-Chalmers HD-15 tractor with Baker dozer. In an average 9-hour working day, the crew laid 30 of the 16-foot sections, or 480 feet of pipe.

THE END

Masonry-Cutting Blades

A new series of break-resistant masonry-cutting blades has been announced by the M. E. McGrath Co., P. O. Box 29, Webster Groves 19, Mo. The new Arrow BRS blades are manufactured in three specifications designed to cut the complete range of masonry materials from ceramic and salt-glazed tile to insulating fire brick.

For further information write to the company, or use the Request Card at page 18. Circle No. 592.

Dragline Bucket Catalog

A lightweight dragline bucket that will efficiently dig and load clay, earth, sand, or gravel is described in an illustrated catalog from the Page Engineering Co., Clearing Post Office, Chicago 38, Ill. A feature stressed in this brochure is that the new Page RL class Dixiebucket automatic dragline is designed so that the first pull on the load line will cause the bucket to shift its entire weight to its teeth to avoid skipping and sliding. The bucket is offered in 1/2 to 3-cubic-yard sizes, measured struck.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 633.

New Hydraulic Pumps For Steering Boosters

Two new series of pumps for hydraulic-steering systems are announced by Vickers, Inc., 1492 Oakman Blvd., Detroit 32, Mich. Series VT16 consists of a Vickers vane-type hydraulic pump with flow control and overload relief valves and an integral oil reservoir. Series VT17 is made up of the same pump and valve units without the reservoir and is offered for installations where a separate tank is preferred.

The Series VT16 power package, designed for use with a hydraulic-steering booster, forms a complete



The new Vickers Series VT16 hydraulic pump for hydraulic-steering boosters.

power-steering system with the simplest possible installation. The unit is bolted on, then it is coupled to the engine—usually by belts. Two hydraulic connections are made to the booster. Smooth steering performance is obtained with the flow control valve, which gives a relatively constant supply of oil to the booster despite variations in engine speed. The Series VT16 and VT17 power packages are available in three factory-set flow-control capacities: 1 1/2, 2 1/2, and 3 gpm.

For further information write to the company and request Bulletin M-5104A, or use the Request Card at page 18. Circle No. 634.

High lift, Big load capacity, Wheeler speed charge hoppers at lower cost

Bin-batching costs drop fast when mixing plants load hoppers with high-lift, long reach, fast-moving MM Wheeler-Loader units.

Loader attachments, built specifically for 30 hp. RTI and 57 hp. UTIL Minneapolis-Moline Wheelers, reach up to load the highest hoppers, out to fill trucks, cars, conveyors.

With exclusive shuttle speeds and instant reversing, the UTIL combines high rate of travel and hydraulic pump efficiency to make each load-and-dump trip in shortest possible time.

Reserve Wheeler power and greater torque at moderate rpm keeps Wheelers operating in heaviest going. For short, fast maneuvering in congested areas, Minneapolis-Moline offers heavy-duty power steering



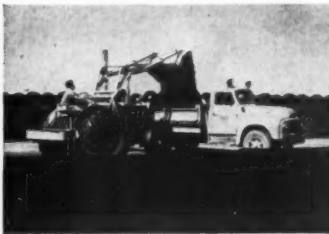
at lower cost. For any loading job, call in your Minneapolis-Moline dealer-distributor. Let him demonstrate how you can save money by replacing expensive, less maneuverable equipment with lower-cost time-saving Minneapolis-Moline Wheeler units.



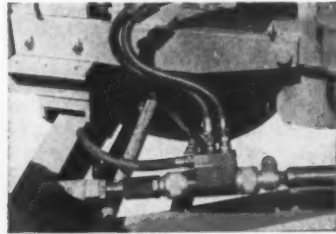
MINNEAPOLIS-MOLINE
Minneapolis 1, Minnesota



Owner of this St. Paul, Minn., mixing plant replaced two loader outfits with this MM Wheeler-Loader unit, loads bins for less.



Wheeler maneuverability plus good bucket control speeds up surface mixing operations. Shuttle gearing spots loads in half the time.

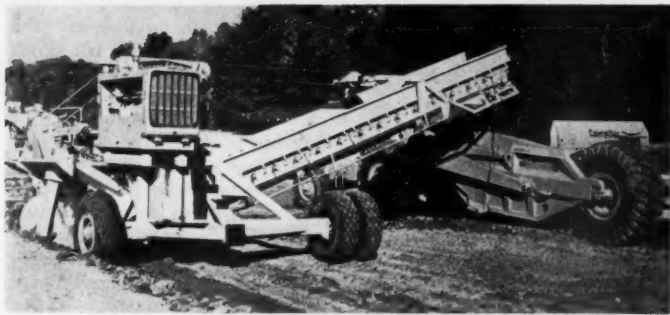


UTIL Wheelers available with hydraulic POWER-flow steering for maximum operating ease. Built-in safety features insure constant control.

CHECK THE RED REQUEST CARD!

For further information on the new equipment, new materials, and new literature described in this issue of *Contractors and Engineers* check the item number on the Red Request Card bound in at page 18. No obligation, of course, and we will forward your request directly to the manufacturer.

CONTRACTORS AND ENGINEERS, 470 Fourth Avenue, New York 16, N. Y.



Conveyor-Type Loader is Self-Powered Unit

■ Design improvements are reported for the Sierra loader, a self-powered conveyor-type loader made by the C & D Mfg. Co., Folsom Blvd., Perkins, Calif. A large-diameter 50-inch disk plow is now used to improve production, particularly

on "dead" or "boney" materials. It is carried on a redesigned heavier plow beam.

The new delivery conveyor design includes a new hypoid-type head-pulley gear box to eliminate shock load damage. Heavier drive-

An improved Sierra loader is teamed up with a Caterpillar DW20 scraper.

line construction and the use of double-row sealed spherical-roller tail-pulley bearings are other features.

A side bar cutting attachment is available for blending stratified borrow-pit material as it is loaded. The moldboard will cut 6 feet while the disk takes its normal 2-foot cut, giving a total of 8 feet.

The loader's maneuverability and one-man operation features are retained. Power is supplied by a Caterpillar diesel engine. A single large crawler tractor handles the unit.

For further information write to the company, or use the Request Card at page 18. Circle No. 636.



The Super-Hole-A-Matic hole digger.

One-Man Power Tool For Digging Holes

■ Two new models have been added to its line of one-man portable hole-digging and tunneling machines by the Multi-Matic Corp., 14741 Bessemer St., Van Nuys, Calif. The new Super Hol-A-Matics dig holes up to 12 inches in diameter and 15 or more feet deep with shaft extensions. Power comes from a motor that operates from a 115-volt 60-cycle ac or dc power source.

The digging machines work with a pulverizing grinding action, riding over large rocks without being damaged and without throwing the operator. They bore at any angle and can be used for digging, tunneling, and soil testing.

For further information write to the company, or use the Request Card at page 18. Circle No. 635.

Booklet on Air Controls For Excavator-Cranes

■ A brochure describing the air-control system on its Michigan line of excavator-cranes is now available from the Clark Equipment Co., Construction Machinery Div., Miller and Second Sts., Benton Harbor, Mich. The booklet, illustrated with pictures and drawings, explains the theory and practical application of the air-controlled clutches which are standard equipment on the excavator-cranes.

Data in graph and table form gives comparative figures on actual time tests of machines equipped with air controls and units with mechanical controls. Eight case histories are included in the brochure.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 556.

AIR GEOLOGICAL METHOD FINDS GRAVEL DEPOSITS

DESIRABLY SITUATED

Could you make money by locating the material deposit with the lowest hauling costs near some construction project now planned? Or near a highway job you have? Do you need additional gravel, rock, sand, or other mineral deposits for your operations?

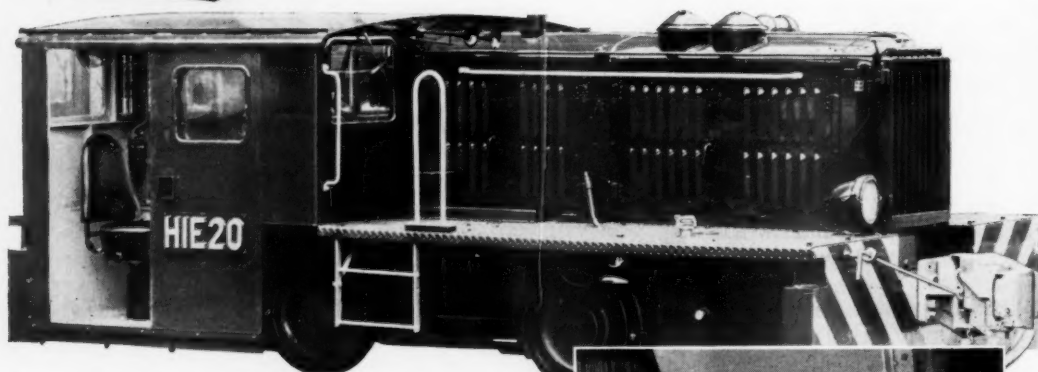
Prospecting by our trained specialists using geological research coupled with air photo interpretation drastically reduces expensive field work. This low-cost prospecting often accomplishes confidentially in weeks what ground reconnaissance could not in years of costly groping and undesirable publicity inflating option prices. Uses methods of World War II invasion terrain studies.

An explanation of your needs written on your business letterhead and a marked map brings you a proposal on our work for you and complete information. No obligation. Dept. CE-1, Washington Commercial Co., 1200 Fifteenth St. N.W. Washington 5, D.C., ADams 4-8060

CONTRACTORS AND ENGINEERS



PLYMOUTH CUTS A 20-TON LOCOMOTIVE DOWN TO MAN-HIGH

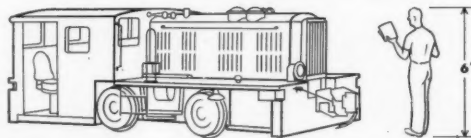
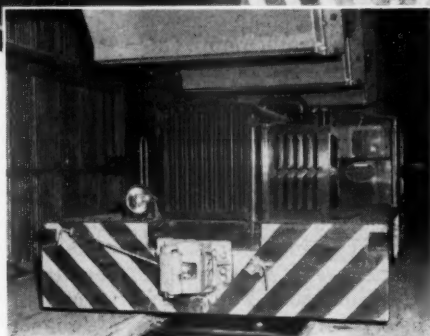


Six Foot, Medium Duty Locomotive Developed for Use under Ore and Limestone Bins in U. S. Steel's Fairless Works

U. S. Steel wanted a standard gauge locomotive of 20 Tons for spotting charging box buggies under the ore and limestone bins in the Open Hearth Shops of their Fairless Works. Standard models were much too high, low-clearance mine locomotives were too light. The only solution: Cut a 20 Ton Standard Locomotive down to a 6 foot overall height so that it could move under the bins and handle the necessary loads. Plymouth engineers went to work on the problem.

Such a radical change in height necessitated relocating many parts and controls, yet this was done without impairing the efficiency and economy of operation in any way! The highest parts are the engine air cleaners which are faired into the hood itself. An impossible job? Plymouth engineers, with over 40 years experience in locomotive building, accomplished it—just as they are prepared to meet your locomotive requirements, however difficult, with an efficient, economical solution.

Models range from 3 to 70 tons, gasoline and Diesel-mechanical, gasoline and Diesel-Torqomotive, or Diesel-electric Drive. Plymouth Locomotive Works, Division of The Fate-Root-Heath Company, Dept. A-12, Plymouth, Ohio.



PLYMOUTH[®] TORQOMOTIVES

To get Plymouth efficiency and economy into your hauling, switching and spotting jobs, send for complete information on Plymouth's narrow and standard gauge locomotives.

ALSO MANUFACTURERS OF F-R-H CERAMIC MACHINERY



The Lombard Model 3 1/2 D chain saw cuts at any angle.

Gas-Powered Chain Saw

■ A new chain saw is offered by the Lombard Governor Corp., Ashland, Mass. The Model 3 1/2 D gasoline-powered saw features jet-fed carburetion. The direct carburetor connection to the crank is said to result in faster starting and more efficient cold weather operation.

An automatic oiler and shut-off protects against excessive wear of the chain and the guide bar by providing constant oil lubrication while the saw is in operation. The saw cuts at any angle.

This model also offers all of the standard Lombard chain-saw features, including rust-resistant chrome plating, balance, automatic clutch and rewind starter, positive chain-tensioning control, high voltage magneto ignition, precision splined sprocket, double bumper spike, and specially designed air-filter case.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 637.

Data on Motor Grader

■ The Adams motor grader No. 660, powered by the 140-hp Cummins engine, is featured in new literature from the J. D. Adams Mfg. Co., P. O. Box 853, Indianapolis, Ind. The front and back covers of the booklet are devoted to action pictures of this heavy-duty 28,000-pound grader, while the inside pages illustrate and describe the construction and operating features of the machine.

The various blade positions are pictured along with detailed views of the unit's constant-mesh transmission, full-floating rear axle, and the engine. Also shown is a wide variety of optional equipment, including scarifier, bulldozer, elevating grader, V-type snowplows and wings, rotary snowplow, and rotary-type snow wing.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 602.



Loader and Snowplow For Wheel Tractor

■ A new front-end attachment that mounts a 1/3-yard bucket and a snowplow is available for the Model F tractor manufactured by the Worthington Mower Co., Stroudsburg, Pa. The manufacturer stresses that the Model F is particularly suitable for mounting front-end attachments. With front-wheel drive and rear-wheel steering, the tractor gains additional traction from the weight of the attachment.

The loader can be used for sand, gravel, snow, and loose dirt. The snowplow blade is interchangeable with the bucket and can be mounted by making four bolted connections.

For further information write to the company, or use the Request Card at page 18. Circle No. 573.

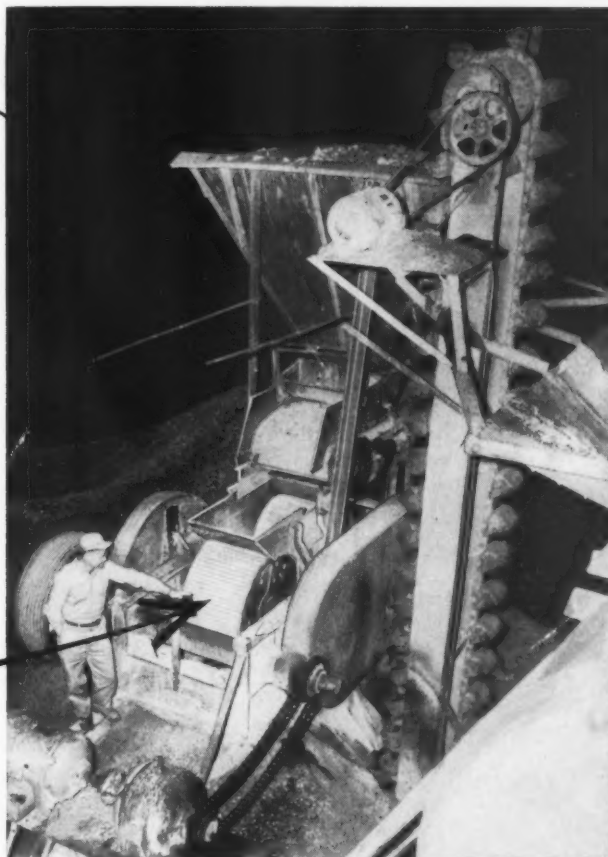


◀ The Worthington Model F tractor with a new front-end loader.

Crushing Life
Increased 500%

by
**Hard-
Facing**

with
HAYNES 90 rod



Hard-facing the rolls in this crusher rig with HAYNES 90 Rod makes them more than 5 times more durable. Two sets of rolls are used to crush rock from 3-in. down to 1/2-in. screen size. They handle up to 26 thousand tons of rock with a minimum of repairs—despite severe wear from abrasion and impact. Other hard-facing materials wore out before 5,000 tons of rock were crushed.

Since HAYNES 90 Rod was adopted as the standard material on this job, production increased, down-time was reduced, labor and maintenance costs were cut, and less hard-facing material was needed per ton of rock crushed. This is typical of the kind of savings that can be realized by hard-

facing with HAYNES alloys.

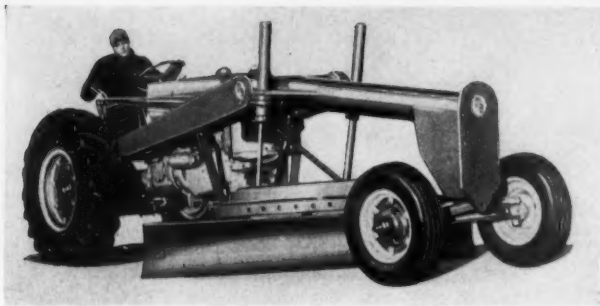
HAYNES hard-facing alloys give outstanding service when used to protect parts in crushers, shovels, tractors, trucks, conveyors, and other metal parts exposed to wear from abrasion, impact, corrosion, or heat.

Your local dealer carries a complete line of HAYNES hard-facing alloys, including: HAYNES iron and nickel-base rods, HAYNES STELLITE cobalt-base rods, and HAYSTELLITE tungsten carbide tube rods. Ask him for descriptive literature. If you don't know the location of your local dealer, write to Haynes Stellite Company, a Division of Union Carbide and Carbon Corporation, Kokomo, Indiana.

See...
or
Write...

Your local Haynes Stellite Dealer
to Haynes Stellite Company

"Haynes," "Haynes Stellite," "Haystellite" are registered trade-marks of Union Carbide and Carbon Corporation.



This Meili-Blumberg grader is designed for the Minneapolis-Moline 30-hp Model RTI tractor.

Grading Machine Built Around 30-HP Tractor

■ The addition of a new grader to its line of construction equipment is announced by the Meili-Blumberg Corp., 757 N. Broadway, New Holstein, Wis. The M-B grader, built around the 30-hp Minneapolis-Moline RTI tractor, will handle grading,

maintenance, and light construction work.

The grading machine, with its 10-foot blade, is capable of handling a wide range of jobs. It provides four forward and one reverse speed. Its tubular frame resists twists and

shocks to keep the unit in proper alignment. The engine, located between the rear wheels and the blade, adds its weight to both traction and blade pressure. Large rear tires supply traction. A hydraulic circle turn is available as optional equipment.

The manufacturer reports that the grader may be attached or removed in less than an hour. It may also be attached to RTI tractors now in service. A full line of attachments—snowplow, shovel, berm leveler, bulldozer, and scarifier—is available.

For further information write to the company, or use the Request Card at page 18. Circle No. 544.

New V-Belt Catalog

■ A new V-belt catalog is available from the B. F. Goodrich Industrial Products Division, Akron, Ohio. The company's grommet belts in standard and high-capacity constructions are featured. New horsepower rating tables are included as an aid to the design of V-belt drives.

Cutaway drawings illustrate the grommet construction with the load-carrying cords concentrated in twin grommets. The grommets are surrounded by tough resilient rubber and bend easily for a more uniform grip. There are no plies of fabric to stiffen the belt and decrease its ability to absorb shock. Drawings show the belt's construction.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 603.

ideas...worth

hundreds of dollars
for the price
of a 3¢ stamp



Here is a collection of interesting case histories of production and maintenance problems which were solved with almost unbelievable ease and speed by the unusual use of a hose clamp to fasten things together and "Hold 'em tight" in place. Send for "Clampways Ideas" while you're thinking about it.*



PUNCH-LOK
Company

*...or get your copy from your near-by Punch-Lok Distributor.

do it now

send me **Clampways Ideas** **FREE**

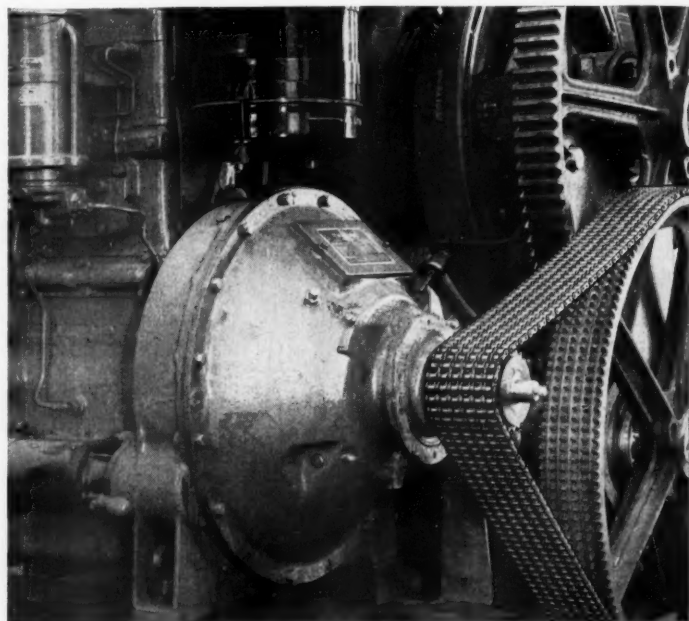
Firm Name _____

My Name _____ Title _____

Address _____

City _____ State _____

4800



Why Leading Engine Manufacturers STANDARDIZE ON TWIN DISC Power Take-Offs

Next time you're watching powered equipment driving through a friction power take-off, check the name plate on the drive back of the engine. In all probability, you'll see a Twin Disc Power Take-Off, putting more horsepower to work. With their simple, rugged design—single-point adjustment—and slippage capacity far in excess of horsepower rating, Twin Disc Power Take-Offs are selected as standard equipment by most of the nation's leading industrial engine manufacturers.

That's why you'll find Twin Disc Power Take-Offs on such leading industrial engines as Ajax - Buda - Caterpillar - Climax - Continental - Cum-

mins - Hercules - International - Le Roi - Minneapolis-Moline - Murphy - Superior - Waukesha - White - Wisconsin... for these manufacturers know they can depend on Twin Disc performance... and they know, too, that wherever their engines may be ultimately working, Twin Disc Service will only be a matter of hours... backed by 60 Parts Stations and 8 Factory Branches or Sales Eng. Offices.

Twin Disc Power Take-Offs are available with clutches ranging from 6.5" to 24" single-plate; from 11.5" to 24" double-plate. Housing sizes No. 6 SAE to No. 00 SAE. Capacities up to 600 hp. Write for Bulletin No. 129-C.



TWIN DISC

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

Branches or Sales Engineering Offices: Cleveland • Dallas • Detroit • Los Angeles • Newark • New Orleans • Seattle • Tulsa

CONTRACTORS AND ENGINEERS

Machine Predicts Floods

Army engineers and others concerned with the problems of flood control and water distribution recently watched an electronic computer predict and show the means of preventing disastrous floods. The machine is the Goodyear Aircraft Corporation's analog computer. It was shown at the Goodyear plant in Akron, Ohio.

The computer digests complicated figures on rainfall, stream capacity, current volume and speed, and other data, and then "creates" a flood. Within minutes, the machine accurately predicts what these conditions

would mean to downstream communities and indicates how, by alternately impounding and releasing the water at critical moments, the flood could have been prevented or held to a minimum.

Calculations that would take a mathematician days to work out are reportedly done in minutes by the unit, which is about the size of a home refrigerator.

Data on Dragline Buckets

■ Dragline buckets available in lightweight, standard, and heavy-duty models are illustrated in literature from the Drake-Williams-

Mount Co., 23rd and Hickory Sts., Omaha, Nebr. Omaha buckets are perforated on the sides and back to increase the payload by leaving the water in the pit when loading. Loading and hoisting chains are of high-carbon alloy steel, with manganese chains available optionally.

Among features stressed in the literature is the higher bucket arch that provides greater clearance for digging and dumping. The box-type arch is welded so that it has more resilience than a solid arch. A rolled alloy-steel continuous lip extends to both sides of the bucket top to strengthen the front end of the bucket. Other design advantages of

the bucket are its light weight, balance, and the wedge shape that makes for quicker loading.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 623.

New Leschen Headquarters

Work was scheduled for completion this month on the modern one-story headquarters office built by Leschen Wire Rope Division, H. K. Porter Co., Inc., St. Louis, Mo., at 2725 Hamilton Ave. in St. Louis. Construction of the new office was the latest step in the company's modernization program.

DISTRIBUTORS

ALABAMA—Tractor & Equipment Co., Inc., 4402 First Ave. N., Birmingham 1, 809 Charles St. Distributor, Ray-Bros. Machinery Co., 2375 W. Fairview Ave., Montgomery 1, P. O. Box 357, Mobile.

ALASKA—Western Tractor & Equipment Co., Box 3023, Anchorage, Box 497, Fairbanks.

ARIZONA—State Tractor & Equipment Co., 497 S. 17th Ave., Phoenix. Lively Equipment Co., Alhambra, N. W.

ARKANSAS—Euclid-Arkansas, Inc., 782 W. Second St., North Little Rock.

CALIFORNIA—Geo. M. Philpott Co., Inc., 1040 Bryant St., San Francisco 32, 329 W. Monte St., Monterey; Sierra Machinery Co., Inc., P.O. Box 1350, Reno.

CANADA—Dietrich Collins Equipment Ltd., 800 S. W. Marine Dr., Vancouver 14, B. C. Ferguson Supply Alberta Ltd., Calgary, Edmonton and Lethbridge, Alberta. S. H. Geddes Equipment Ltd., 28 James Ave., Toronto; P. O. Box 187, Port Arthur, Ontario; P. O. Box 89, N.W. Cumberland, B.C. Maritime Newfoundland Agencies Ltd., P. O. Box 322, Halifax, N. S.

COLORADO—Colorado Builders' Supply Co., 1300 West Evans Ave., Denver.

CONNECTICUT—The W. I. Clark Co., 3186 Blawie Ave., New Haven.

DELAWARE—L. B. Smith, Inc., Camp Hill, Penna.

FLORIDA—Florida-Georgia Tractor Co., 2808 W. Beaver St., Jacksonville; 2415 State St., Lakeland; 3125 No. Miami Ave., Miami; 237 S. Orange Blossom Trail, Orlando; New Orleans Highway, Tallahassee; 218 S. 12th St., Tampa.

GEORGIA—Tri-State, Inc., 880 Glenwood Ave. S.E., Atlanta 1; East Side Highway, Marietta; Olive St., Augusta; 713-14 No. Washington St., Albany.

ILLINOIS—Grues Brothers, Ltd., 779 Alhambra Road, Homewood 10, Memphis.

IDAHO—Intermountain Equipment Co., Broadway at Myrtle St., Boise; 210 No. 4th St., Pocatello.

INDIANA—Gil Boers Equipment Co., 7823 South Locust Ave., Chicago 28. Euclid Sales & Service, Inc., St. Louis 10, Mo.

INDIANA—Reid-Holcomb Co., 1818 Knochway Ave., Indianapolis 23, Gil Boers Equipment Co., Chicago 28.

IOWA—Herman H. Brown Co., Des Moines, Cedar Rapids and Sioux City. John Tractor & Equipment Co., Omaha 2, Mo.

KANSAS—The G. W. Van Koppel Co., Kansas City 3, Mo.

KENTUCKY—Euclid-Kentucky, Inc., 3900 Crittendon Drive, Louisville.

LOUISIANA—Euclid-Memphis Sales, Inc., Memphis 2, Tenn.

MAINE—M. A. Burkitt, Inc., Route 1, E.F.S. 2, South Portland.

MARYLAND—Atlas Equipment Co., Clarksburg, W. Va. L. B. Smith, Inc., Camp Hill, Penna.

MASSACHUSETTS—Clark-Wilson Co., 118 Western Ave., Boston 26. The W. I. Clark Co., New Haven, Connecticut.

MINNESOTA—W. H. Anderson Co., Inc., 47 West Seven Mile Rd., Detroit 3. The Euclid Road Machinery Co., Hibbing, Minn.

MISSISSIPPI—The Euclid Road Machinery Co., Highway 168 West, Hattiesburg.

MISSISSIPPI—Euclid-Memphis Sales, Inc., Memphis 2, Tenn.

MISSOURI—Euclid Sales & Service, Inc., 2231 Manchester Ave., St. Louis 8. The G. W. Van Koppel Co., 2481 Pennway, Kansas City 8.

MONTANA—Mail-Ferry Machinery Co., P. O. Box 1367, Butte.

NEBRASKA—Fehrs Tractor & Equipment Co., 1890-11 Cumby St., Omaha 2, Colorado Builders' Supply Co., Denver.

NEVADA—Sierra Machinery Co., Inc., P. O. Box 1350, Reno; Geo. M. Philpott Co., San Francisco; Monterey, California. Felner Equipment Co., Salt Lake City 3, Utah.

NEW HAMPSHIRE—Clark-Wilson Co., Boston 26, Mass.

NEW JERSEY—L. B. Smith, Inc., Camp Hill, Penna. Hubbard & Floyd, Inc., New York 51, N. Y.

NEW MEXICO—Lively Equipment Co., 2801 No. Fourth St., Albuquerque.

NEW YORK—Hubbard & Floyd, Inc., 181st St. & Gerard Ave., New York 51. P. T. Equipment Co., 2360 Sheridan Dr., Buffalo. L. B. Smith, Inc., 257 W. Fayette St., Syracuse 2; 134 State St., Albany.

NORTH CAROLINA—North Carolina Equipment Co., P. O. Box 840, Greenville 1, P. O. Box 1358, Charlotte; Swanton Creek Rd., Asheville; P. O. Box 123, Guilford; P. O. Box 885, Winston-Salem. Hampton Roads Tractor & Equipment Co., Norfolk, Virginia.

NORTH CAROLINA—Northwestern Equip. Co., Box 152, Fargo.

OHIO—The W. W. Williams Co., 2300 S.W. Columbus St., 19301 Brunkard Rd., Cleveland 11; 914 Main St., Cincinnati 15; 1300 Cornett St., Toledo (Maumee).

OKLAHOMA—Butler-Sparks Equipment Company, Oklahoma City and Tulsa.

OREGON—Intermountain Equipment Co., Boise, Idaho. P. L. Crooks & Co., 2146 N.W. Pettygrove St., Portland.

PENNSYLVANIA—Atlas Equipment Corp., 535 Ridge Ave., Pittsburgh 13. Euclid Sales & Service, Inc., 182 Barton St., Williamsport; Westport & Lycoming St., Williamsport. L. B. Smith, Inc., Camp Hill (Harrisburg) 29th & Montgomery Avenues, Philadelphia.

PUERTO RICO—Clark-Wilson Co., 1223 Puertobello St., E. Providence.

SOUTH CAROLINA—Southern Equipment Sales Co., Sumter Highway, Columbia.

SOUTH DAKOTA—The Euclid Road Machinery Co., Hibbing, Minnesota.

TENNESSEE—Euclid-Memphis Sales, Inc., 198 E. Butler Ave., Memphis 2. Power Equipment Co., 1218 Island Home Ave., Knoxville 409 S. E. Chattanooga St., Chattanooga; 121 Clay St., Kingsport.

TEXAS—The Euclid Road Machinery Co., 1097 Levee St., Dallas 2. Lively Equipment Co., P. O. Box 1436, El Paso.

UTAH—Fehrs Tractor & Equipment Co., 1581 So. East West, Salt Lake City 8.

VERMONT—Clark-Wilson Co., Boston 26, Mass.

VIRGINIA—Hampton Roads Tractor & Equipment Co., 92nd and Kilham Ave., Norfolk. Wm. Equipment Co., 1501 Chamberlaine Ave., Richmond 10; 405 Center Ave. N.W., Roanoke 7.

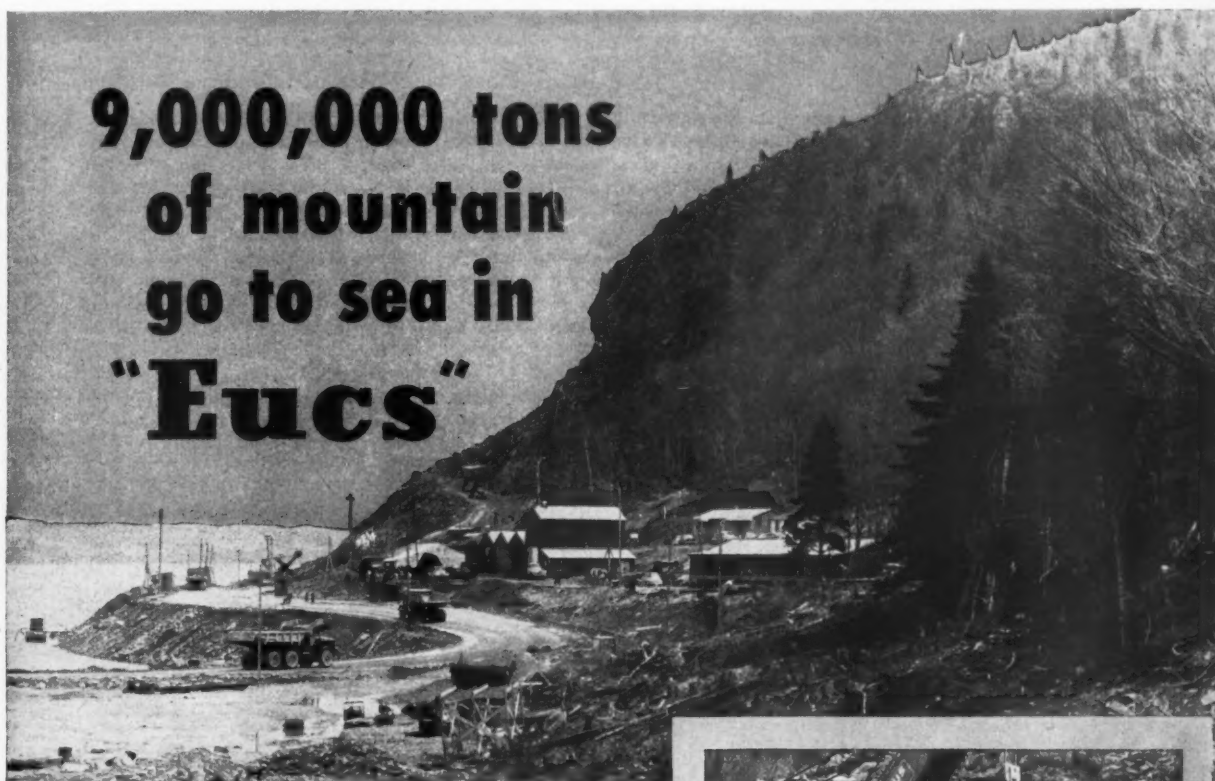
WASHINGTON—Western Tractor & Equipment Co., 1235 First Ave., Seattle 2; 983 Third St., Chehalis; Rt. 12, Box 94, Yacolt. Intermountain Equipment Co., 611 Spruce Ave., Spokane 2, Portland, Oregon. P. L. Crooks & Co., Portland, Oregon.

WEST VIRGINIA—Atlas Equipment Corp., Pittsburgh. Wm. Equipment Co., Kanawha Blvd., Charleston 23; East on U.S. 90, Clarksburg; P.O. Box 188, Blountsville.

WISCONSIN—Cunningham-Ortmeyer Company, Milwaukee 48, Eau Claire and Green Bay. Fehrs Tractor & Equipment Co., Salt Lake City 8, Utah.

WYOMING—Colorado Builders Supply Co., Casper.

9,000,000 tons of mountain go to sea in "Eucs"



Canso Causeway in Nova Scotia will join Cape Breton Island with the mainland. About 9 million tons of rock from Porcupine Mountain will form a 4,300 ft. causeway across the Strait of Canso making Cape Breton coal more accessible to the steel plants of Nova Scotia.

Northern Construction Co. and J. W. Stewart Ltd. are using a fleet of twelve 34-ton and two 22-ton Rear-Dump "Eucs" to handle this big tonnage of tough granite. Loaded by 6-cu. yd. shovels on the side of the mountain, the "Eucs" haul their loads a mile or more to the causeway on a 3 shift round-the-clock schedule. Euclid dependability has been an important factor in maintaining the fast pace on this huge project.

On big, tough jobs like the Canso Causeway, as well as on more routine construction and mining operations, the advanced engineering and high job availability that's built into every "Euc" pays off for owners in high production and lower costs. For information on Euclids—a complete line of equipment including Rear-Dumps, Bottom-Dumps, Loaders and Scrapers—get in touch with your nearby Euclid distributor soon.



The 34-ton "Eucs" and 6-yd. shovels make an efficient, well balanced team. Every load of rock is weighed before it is dumped on the causeway—less than full capacity loads are few and far between.

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio



Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



Sand Fill Across Marsh Forms Roadway Grade

**Dredges dig 2,430,000 cubic yards
of muck from swamp; place
3,770,000 cubic yards of sand**

CONNECTING the bridges which span the East and West Pascagoula River channels in southeastern Mississippi is 2½ miles of roadway fill built across the tidal marsh at the mouth of the Pascagoula River. This dredge fill, paving, toll-collection facilities, and the two bridges make up a project which, when completed this September, will carry U. S. 90 across the swamp.

The swamp is a bed of muck from 38 to 52 feet deep, containing silt, clay, and decayed vegetable matter.

On the surface, it is a grassy marsh interspersed with bodies of water, the largest of which is known as Lake Lowery. The old highway crossing consists of a low irregular fill, practically floating on the soft muck, which provides an unstable support for the narrow road. Since this roadway did not lend itself to widening or improvement, it will be abandoned when the new road is opened.

Under a separate paving contract, a 4-lane divided highway will be

paved across the new fill to connect the bridges. Two concrete roadway slabs, 24 feet wide and 8 inches thick, will be separated by a 21-foot sodded median. Pavement edges adjacent to the median will be finished with integral cycloid curbs. Shoulders 10 feet wide on the outside of both roadways will be built up of 2 inches of compacted shells to finish off the section.

This work is being done for the Mississippi State Highway Department and was financed by a bond

issue of nearly \$9,200,000 which will be repaid from tolls. Hazelet & Erdal, consulting engineering firm, Louisville, Ky., is the designer and is supervising construction. Jahncke Service, Inc., New Orleans, La., general contractor for dredging, sublet some of the work to McWilliams Dredging Co., New Orleans, La., and Great Lakes Dredge & Dock Co., Chicago, Ill.

Muck was removed down to firm sand to make a huge trench paralleling the old road. This trench meas-



Making the first cut through the marsh, the dredge Conical excavates an area about 90 feet wide and 10 feet deep. The dredge has a steel and aluminum boom 240 feet long to handle clamshell buckets of 6 to 12-yard capacity.

C&E Staff Photo



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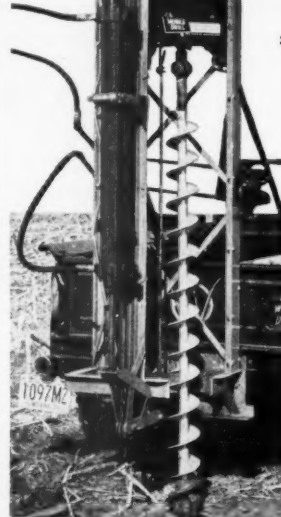
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Sand from the bottom of the West Pascagoula River Channel is picked up by the 20-inch hydraulic dredge Tchefuncta. With the aid of a booster, this dredge pumps the material more than 6,000 feet to the fill.

C&E Staff Photo



Midway between the Tchefuncta and the fill is Jahnc Service's booster pump No. 2, driven by a GM 900-hp, 12-cylinder diesel engine. Dredge and booster averaged about 13,500 cubic yards of sand fill daily.

C&E Staff Photo

ures at least 70 feet wide at the bottom, 150 feet wide at the surface, is from 38 to 52 feet deep and 2½ miles long. This big cut required the removal of 2,430,000 cubic yards of muck. The excavation was then backfilled with sand dredged from the two river channels. The fill was carried up to 10 feet above mean Gulf level across a section 71 feet wide. From this crown, the sand fill was carried out over the marsh at side slopes of 15 to 1.

Five dredges and two boosters

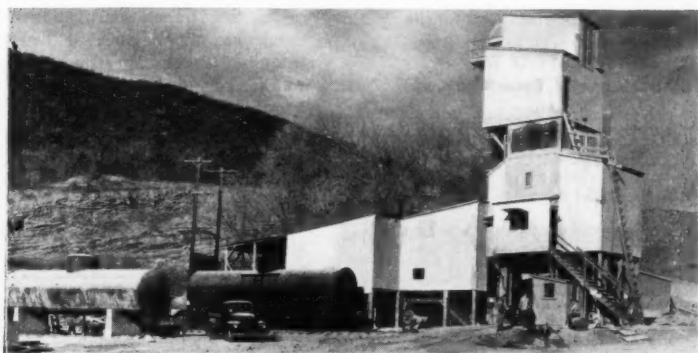
combined their capacities to build this roadway grade. The first cut was started in March, 1953, and by March of this year, the last of the 3,770,000 yards of sand fill was in place. The first dredge on the job was the Conical, owned by Great Lakes Dredge & Dock Co. This diesel electric clamshell dredge is fitted with a boom 240 feet long which handles clamshell buckets of 6 to 12-yard capacity. Its revolving frame is supported on roller bearings at the top of a 52-foot-high cone.

The main machinery, boom hoist, and swing and spud winches are all mounted on the revolving frame. A Busch-Sulzer 1,000-hp diesel engine provides the principal source of power, while independent electric motors drive the operating units. The main hoisting machinery is powered by a 200-hp electric motor.

The first assignment for the Conical was to dig a small boat channel across the marsh to connect the two river channels. This replaced an existing canal, located adjacent

to the old highway, which was obliterated in disposing of the muck excavation. The new canal, 55 feet wide, 9 feet deep, and 2½ miles long, parallels the highway about 1,500 feet to the north. River traffic which cannot get under the West Pascagoula River bridge uses this canal to get to the east channel where swing and bascule bridges provide greater openings. Material dredged from the canal was cast into the marsh on either side.

After completing the small boat



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ANTHONY COMPANY
STREATOR, ILLINOIS



The dredge Wahalak's discharge line—Armco spiral-welded pipe with Mobile Pulley & Machine Co. ball joints—is moved to a new landing.

C&E Staff Photo

channel, the Conical moved to the center of the highway alignment and began the job of stripping the big trench. Here the dredge's 240 feet of steel and aluminum boom enabled it to excavate a channel 90 feet wide and about 10 feet deep. Material was deposited in retaining levees far to the side. Material which was later excavated by hydraulic dredge was prevented from flowing back into the cut by these levees. By mid-June, the Conical had completed the pilot cut and in so doing had moved about 20 per cent of the material marked for excavation. The remainder was left to the hydraulic dredges.

Dredges Dig Muck

Jahncke and McWilliams divided the rest of the job into approximately equal sections, Jahncke taking

the westerly half and McWilliams the easterly portion. About June 1, 1953, McWilliams' hydraulic dredge Vicksburg started stripping the east half of the cut. By September 4, she had completed the muck excavation on that half and moved out into the channel of the East Pascagoula River to start pumping sand back into the trench.

The Vicksburg is a 20-inch dredge powered by a General Motors 1,800-horsepower 16-cylinder diesel engine which drives the dredge pump through a 2 to 1 reduction gear. The Mobile Pulley & Machine Co. pump is equipped with a 64-inch 4-vane runner which turns at 380 rpm. A Worthington 4-cylinder, 300-hp diesel engine, driving a 170-kw generator, provides power for all auxiliaries. The suction line and cutter are carried on a 78-foot ladder which enables the dredge to dig 55 feet deep. This ladder was later lengthened to 110 feet and cut to a maximum depth of 85 feet.

Measuring 115 feet long by 36 feet wide, the steel hull of the Vicksburg has a draft of 6 feet. Her 75-foot steel spuds are square 19-inch box sections with internal cross reinforcing. On both sides of the bow are anchor booms, 65 feet long, which enable the dredge to move her swing anchors without assistance from an anchor barge. The crew of 75 men, including those working on shore as well as three shifts on the dredge, was housed in a separate quarters boat tied up nearby.

On the trench excavation, the muck was simply pumped over the retaining levees. By using landings spaced about 400 feet apart, the length of discharge line was kept short. In some cases, where the borrow pits from which the sand fill was obtained were more than a mile from the fill, discharge lines became much longer. At times, the Vicksburg was pumping through as much as 5,000 feet of discharge line without a booster.

Early last January, McWilliams brought in the booster Arkansas to assist the Vicksburg and permit her to range further upstream for sand. The Arkansas is a 20-inch booster powered by a Fairbanks-Morse 1,400-hp diesel engine.

Hydraulic dredging in the west half of the cut started in August, 1953, when Jahncke's steam dredge Wahalak moved into the channel. Taking half of the depth in the first cut, the Wahalak used a spill-barge with the discharge line overhanging 182 feet to deposit the strippings well beyond the retaining levee on the south side of the channel. The bottom half taken in the second cut contained harder clay. This was discharged over the north levee through shore pipes with landings spaced about 400 feet apart.

The spill-barge was made from the hull of the old stern-wheel Standard Oil Co. towboat Slack Barrett, which was cut in half to leave a 42 x 96-foot hull. An A-frame 40 feet high supported the long overhang of the discharge pipe at one end of the barge, while water and weights provided counterbalance at the other end. As the Wahalak moved along, the spill-barge followed, thus eliminating the delays ordinarily involved in changing landings.

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the old Wahalak proved to be a producer, stripping the west half of the big channel as much as 52 feet deep in three months of dredging. Her steam engines turned the 96-inch pump runner at 180 rpm. The 150 x 42-foot hull has a draft of 12 feet and carries living accommodations for 54 men. Bunker C fuel oil for the boilers was supplied from 5,000-barrel fuel barges towed from New Orleans by Jahncke's towboat.

While stripping the cut, both the Vicksburg and the Wahalak frequently encountered old well preserved cypress knees as large as a foot in diameter and up to five feet long. These came through the suction line to stick in the pump. In one area, the Vicksburg stopped as often as 30 to 40 times a day to remove these tough knees from the pump. Although they were buried from 25 to 50 feet in the mud, these old pieces of cypress were sound and tough and were a real problem for the dredge crews.

Fill With Two Dredges

In order to speed up the backfill operation, Jahncke used two 20-inch dredges, the diesel-powered Tchefuncta and the steam turbine-powered Pontchartrain. The first to arrive on the job, the Pontchartrain, moved into the channel of the West Pascagoula River and started placing the sand fill from the west end of the cut. Late in November, 1953, when the Pontchartrain had been at work for about a month, the Tchefuncta arrived and the two began a joint filling operation.

The Tchefuncta kept her discharge line out ahead, bringing the fill up above water level in the middle of the channel, but leaving the edges below water. The discharge line from the Pontchartrain followed to top out the section to finished grade and place the flat side slopes over the marsh on both sides. Water from the Pontchartrain's line escaped along both sides of the fill placed by the Tchefuncta.

As the dredges placed the sand fill from both ends toward the middle of the cut, some muck from the dredging operations and some which eroded from the banks of the cut accumulated and was trapped in the area between the two fills. Since this material was not suitable for the fill, the Wahalak was maintained in the muck trench, pumping the material over the retaining levees through shore pipes.

The 5-inch wooden-frame hull of the dredge Pontchartrain measures 100 x 38 x 11 feet and has a draft of 10 feet. Her boilers burn bunker C fuel oil to produce steam for the Elliott 1,600-horsepower steam turbine which drives the main pump. The turbine turns at 3,300 rpm and drives the 60-inch runner of the Mobile Pulley & Machine pump at 350 rpm through reduction gears. Auxiliary power is supplied by a 400-hp General Electric turbine driving a 300-kw generator.

Mounted on the end of the 55-foot ladder is a 5-foot 6-blade basket-type cutter, driven at 23 rpm by a Fairbanks-Morse 250-hp motor. Steel-encased timber spuds 85 feet long are mounted in the rear of the hull. Two 65-foot anchor booms on the bow handle the swing anchors.

An elaborate water purification system enables the dredge to draw her supply from water in which she works.

This dredge has pumped as far as 5,800 feet without a booster, and on this job, she was able to maintain an average production of close to 9,000 cubic yards of fill per day through about a mile of line and against a net lift of 13 feet. The crew of 60 men, including those working on shore, were housed on the dredge and in a separate quarters boat anchored nearby.

Although their pumps are the same, the Pontchartrain and Tchefuncta differ in practically every other respect. The Tchefuncta's main pump is driven by a 1,250-hp De La Vergne diesel engine which turns at 250 rpm and is direct-connected to the pump. A 400-hp Baldwin diesel



Fill is brought up above water by the dredge Pontchartrain. A baffle on the end of the discharge line spreads the material to lessen erosion.

C&E Staff Photo

drives a 300-kw Westinghouse generator to supply power for the 6-foot cutter head. Auxiliary power is produced by a 175-hp Buckeye diesel engine driving an Elliott 100-kw generator and a 300-hp De La Vergne diesel driving a Westing-

house 175-kw generator.

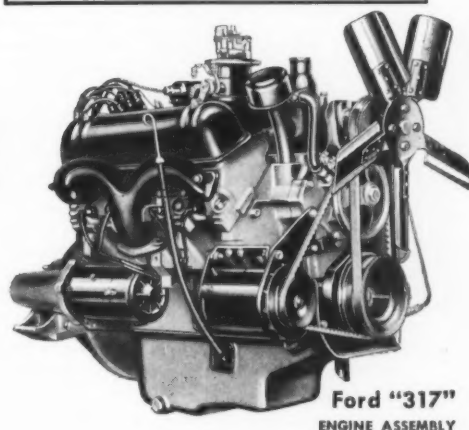
With a ladder 94 feet long, the Tchefuncta can dig 60 feet deep, and this depth was utilized in some of the borrow areas. The steel-encased timber spuds are 85 and 95 feet long. Anchors are handled by 70-foot

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anchor booms. Some of the crew of 75 men was housed on the dredge and some in a separate quarters boat moored alongside.

On this job, the Tchefuncta worked from the most distant borrow areas. It utilized a booster to deliver the material through lines well in excess of 6,000 feet long. The 20-inch booster pump was driven by a 900-horsepower G-M diesel engine through a 2.5 to 1 reduction gear. The 30 x 120 x 8-foot hull of the booster was moored in the small boat channel about halfway between the borrow pit and the fill. With the aid of this booster, the Tchefuncta produced a daily average of about 13,500 cubic yards of fill with a net lift of about 6 feet.

All of Jahnncke's dredges used Armco spiral-welded pipe. Shore



Checking over the work from the deck of a motorboat are C. E. McAuley, superintendent for Jahnncke Service, Inc., and Captain Steve Bertrand, McWilliams Dredging Co. C&E Staff Photo

lines were made up of 14-foot joints with slip couplings and lug and turn-buckle clamps. Most of the pontoon sections consisted of a 42-foot length of pipe mounted on two cylindrical floats, 22 feet long and 42 inches in diameter. Mobile Pulley & Machine Co. ball joints provided flexibility in the floating line. A baffle on the end of the discharge line spread the discharge fan-wise. This reduced the velocity of the water and caused the sand to deposit quickly and without much erosion.

Caterpillar D6 tractors with dozers, working on both fills, dressed up the section to finished shape and grade and hauled pipe and other supplies. At the extreme east end of the dredge project, a road crossed the alignment of the new highway, and it was necessary to keep this road open during the construction of the bridge. In order to have material available to complete the fill in this area, McWilliams used a big P&H dragline to stockpile a large amount of sand. Later when the bridge abutment was complete, this material was used to build the approach fill.

Personnel

Supervising the operation for Jahnncke Service, Inc., was superin-

tendent C. E. McAuley. Those in charge of the several dredges were: Pontchartrain, Captain Joseph L. Boudreaux; Tchefuncta, Captain O. C. Daussin; Wahalak, Captain M. L. Johnson; and Vicksburg, Captain Steve Bertrand. C. S. Hill is resident engineer for Hazelet & Erdal on the entire project and thus represents the Mississippi State Highway Department. R. A. Harris is chief engineer of the department.

THE END

Mobile Radios Operate On 6 or 12-Volt Source

A new line of 144 to 174-megacycle 10 and 25-watt two-way FM radios has been announced by Motorola Communications & Electronics, Inc., 4545 W. Augusta Blvd., Chicago, Ill. Known as the Universal Uni-Channel series, the new mobile models operate interchangeably from either 6 or 12-volt automotive electrical systems without any circuit modification. They feature a dual-interrupter all-vibrator power supply for operation of both the transmitter and receiver circuits.

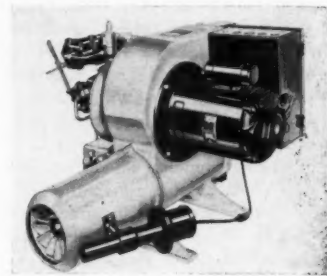
The universal 6/12-volt feature is important in view of the trend in automotive design from 6 volts to the more efficient 12-volt electrical systems. The manufacturer points out that the universal feature protects the radio investor for an extended amortization period during the transition in the automotive industry. It also permits greater flexibility in the operation of radio-equipped fleets having vehicles with both 6 and 12-volt systems since mobile units may be interchanged.

The power-cable kits permanently installed in the vehicles differ with the battery voltage so that, in effect, automatic switching occurs when the unit is transferred from one vehicle to another.

For further information write to the company, or use the Request Card at page 18. Circle No. 517.

Versatile Oil Burner

Introduction of a new oil burner is announced by the Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis. Because of its 35 per cent increase in capacity, the 4 Hev-E-Oil burner is adaptable to a wider range of heating conditions. It is ex-



The new 4 Hev-E-Oil burner

pressly designed for fuel uses that consume more than 6,000 gallons of oil annually.

Like other models in this burner line, this unit is a low-pressure air-atomizing-type burner. It is an all-electric ignition oil burner designed to burn low-cost No. 4 or 5 oil without preheating. The burner's fuel flexibility also results from the fact that it is better adapted to and easily adjusted for burning regionally varying oils, from No. 1 light oil through No. 5 heavy oil.

The new burner is supplied as a complete package ready to be set into a boiler or heating plant. It is completely wired and ready for service lines. One of the features of the new burner is that the control box is mounted on the burner and is readily accessible. No front plates, secondary air, or checker-work hearth is needed. All primary and secondary air is furnished by the burner. An oil-metering pump accurately measures the correct amount of oil for any given operating condition.

For further information write to the company, or use the Request Card at page 18. Circle No. 627.

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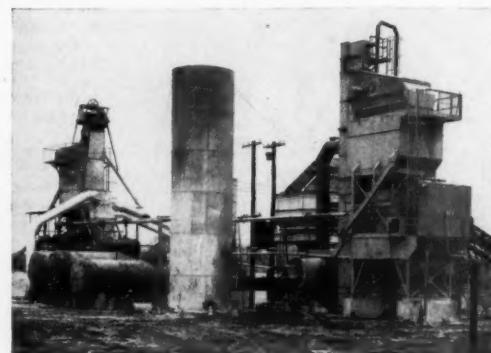
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Valley Asphalt Co. of Cincinnati, Ohio, purchasers back in 1934 of the 40-50 tons per hour capacity* Cummer Asphalt Plant pictured on the left, are typical of alert, sound-business paving contractors who can be relied on "to deliver the goods".

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Rated as a 1-yard excavator, the new Model LS-98 Link-Belt Speeder machine can be transported over most state highways without major dismantling.

Portability Featured in One-Yard Excavator

■ A 1-cubic-yard excavator-crane designed with a view to highway portability has been announced by the Link-Belt Speeder Corp., 1201 6th St. S. W., Cedar Rapids, Iowa. The Model LS-98, with a wide and long crawler base, has enough weight to provide the stability it needs to handle its rated capacity. The machine weighs approximately 53,000 pounds as a shovel. Without major dismantling, it can be loaded on a flat-bed trailer and still fall within the highway load limits prescribed by many states.

Another of the features of the new excavator is its Speed-o-Matic control. The unit's hydraulic power control system is reported to provide fast working cycles and easy operation. Maintenance problems have been taken into consideration so that the new model has no mechanical clutch linkage. The machine's control system brings oil under pressure directly to the clutch. The clutch is said to be self-adjusting for heat and normal lining wear. It is emphasized that the shovel-crane has power load-lowering reversing clutches for either or both front and rear drums. Another operating advantage is that the clutch

has a variable-pressure control valve that provides a feel of the load, thus eliminating any jerk, jump, or lag.

Power steering and two-speed travel gear are standard equipment. The track system is of self-cleaning design. Digging brakes, as well as all traveling and steering functions, are controlled from the cab. The unit has a 14-inch ground clearance, and lower frame machinery is fully enclosed. As a result, there are no underhanging housings or gear cases to foul or snag.

Standard equipment includes conical hook rollers on tapered roller bearings, antifriction bearings at all vital points, splined shafting throughout, enclosed travel and deck gears running in oil, independent chain crowd for shovel operation, and a full-revolving fairleader that reduces dragline cable wear. Extender cables for dragline and crane booms, a cab-top window for improved visibility, and a retractable gantry which is raised and lowered under power are also standard. Independent swing and travel is offered optionally.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 580.

Device for Testing Diesel Fuel Injection

■ A new method of checking fuel injection systems on diesel engines—using bimetallic dial-type thermometers—is reported by W. C. Dillon & Co., Inc., P. O. Box 3088, 14620 Keswick St., Van Nuys, Calif. The Dillon thermometers are screwed into the exhaust manifold for the test.

If all thermometers register equally and if this temperature corresponds to factory standards, the fuel pump is shown to have been correctly calibrated. Otherwise, it is readjusted to produce the proper amount of fuel. In the event that any thermometer reads higher or lower than the others, it is an indication that the fuel injector, feeding the cylinder to which this particular instrument is attached, is not adjusted correctly.

These instruments are available in 32 standard models and have stems up to 72 inches in length. Temperature ranges are from minus 40 to plus 160 degrees F and up to 200 to 1,000 degrees F.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 571.

Literature on Form Stake

■ Details on a new form stake are given in literature from the Rockford Bolt & Steel Co., 126 Mill St., Rockford, Ill. The Saber stake, featuring a forged steel point, is said to be easy to drive through hard or rocky ground. The stake is 48 inches long and is made of 1½-inch-round bar steel. A 2 x 4-inch carrier at the upper end of the stake makes it suitable for use as a temporary barricade.

The company also manufactures form rods, tie rods, truss rods, turnbuckles, and grading pins.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 622.



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Earth-Moving Industry Meets For Conference

MORE THAN 700 members and guests of the Society of Automotive Engineers, Central Illinois Section, heard varied technical aspects of earth-moving equipment discussed at the 5th annual Earth-moving Industry Conference held in Peoria, Ill., April 13 and 14. At technical sessions, papers were presented on what the contractor wants in earth-moving equipment, the need for a test code and its objectives, discussion of instrumentation, results and evaluation of field test, downtime, front-end shovels in the earth-moving industry, engine requirements for earth-moving equipment, and engineering-sales progress. Professional activity committees within the SAE serve such specialized fields as tractor machinery and diesel engines, both major components of the earth-moving industry.

Harald T. Reishus, vice president, International Harvester Co., Industrial Power Division, gave the keynote address at the opening session. "Earth-moving sets the pace of progress," he declared, "and it is truly said that faith can move mountains. In so doing it uncovers wealth and prosperity."

Viewing with alarm the present disappearance of the thin layer of topsoil from large areas in six southwestern states, Mr. Reishus compared it to the dust bowl conditions of 20 years ago which prompted John Steinbeck to write his "Grapes of Wrath". "Water and dust are our enemies when we let them get out of control," Mr. Reishus stated, adding that "the conservation of water and soil is a challenge to the earth-moving industry."

In discussing the valuable part that earth-moving equipment played in fighting Missouri Valley floods in recent years, he pointed out that this equipment would have been more efficiently used if it had been put to work building dams to conserve

TYPICAL COMPARATIVE ANALYSIS CHART OF EXCAVATING EQUIPMENT

	Machine A	Machine B
Investment	\$34,750	\$40,000
Heaped capacity, cu. yds.	17.5	23.0
Pay load, maximum in earth, cu. yds.	14.0	18.4
Pay load weight, at 3,000#/cu. yds.	42,000#	55,200#
Gross weight	88,750#	110,800#
Lbs. per rated horsepower	394	403
Top speed	35.2 mph	34.1 mph
Loading speed, 1st gear	3.32 mph	2.88 mph
Rimpull in low	20,000#	24,850#
Pusher tractor drawbar—approx.	40,000#	40,000#
Total DB available for loading	60,000#	64,850#
Per cent load weight in lbs. to rimpull in lbs.	70	85
Loading time	.59 min.	.75 min.
Pusher tractor cycle	1.6 min.	1.8 min.
Pusher loads per hour	37.5	33.3
Yards per pusher hour	525	613
Cycle time: load	.59 min.	.75 min.
turns	.50 min.	.50 min.
dump	.50 min.	.50 min.
accel. and brake	1.50 min.	1.50 min.
fixed	3.09 min.	3.25 min.
Travel time, 1 mi. one-way haul	3.41 min.	3.52 min.
Cycle—complete round trip	6.50 min.	6.77 min.
Trips per 50 min.	7.69	7.39
Pay yards/50 min. hour	108	136
Cu. yds. each machine will move in 10,000 hrs.	1,080,000	1,360,000
Excess cu. yds.	.....	280,000
Ownership and Operating Costs Per Hour		
Investment, West Coast, approx.	\$34,750	\$40,000
Tire replacement cost, approx.	6,000	7,000
	\$28,750	\$33,000
Depreciation, 10,000 hr.	2.875	3.300
Interest, insurance, taxes	1.043	1.200
Fixed	3.918	4.500
Fuel	0.745	0.910
Gas	0.030	0.030
Lube oil	0.157	0.191
Hyd. oil	0.007	0.007
Grease	0.075	0.075
Labor, oil and grease	0.300	0.300
Repairs, labor	1.100	1.100
Repairs, parts	2.300	2.640
Tires	1.800	2.020
Variable	6.514	7.273
Operator	3.250	3.250
Total	\$13.682	\$15.023
Production estimates		
Cost per yard	0.1267	0.1105
Cost		
1,080,000 cu. yds.	\$136,836	.....
1,360,000 cu. yds.	.....	\$150,280
Yield		
At 25c for 1,080,000	270,000	.....
At 25c for 1,360,000	.....	\$40,000
Excess receipts over disbursements	133,164	189,720
Extra earnings	.....	\$56,556

water and prevent the loss of much valuable topsoil.

The speaker told the conference that the manufacturers of earth-moving equipment are a good example of the American free-enterprise system. "They are here today," he noted, "to talk over common problems and to see what the customers want. Tomorrow they will again be competing with each other to build better machines."

What the Contractor Wants

The needs of the customer were outlined by Kenneth F. Park, a consultant with Peterson Tractor & Equipment Co., San Leandro, Calif., in a paper, "What the Contractor Wants in Earth-moving Equipment". Mr. Park said that from the contractor's point of view, the ideal piece of equipment should meet four requirements: (1) low initial cost; (2) prodigious performance; (3) minimum downtime and maintenance; and (4) high turn-in value. These demands are not excessive, Mr. Park declared. But in looking for low initial cost, he said, the contractor should consider more than the price tag. The higher priced machine may be the best profit-making unit, while the one with lower cost sometimes should not be taken even as a gift. His feelings were that the manufacturer, and not the contractor, should have the responsibility for testing a machine. On the other hand, a record of the contractor's operating costs should be made available to the manufacturers for their benefit.

As to performance, a machine with a high rate of performance but with high maintenance costs is not desirable, according to Park. Downtime and maintenance, he declared, are influenced by such factors as the manufacturer's design, fabrication and quality of materials, distributor service, and the operation and care

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- Optional equipment includes one side dirt delivery attachment to deposit spoil on either right or left side of trench.
- Crumbers available to provide clean, smooth, accurate trench bottom.
- Choice of 7 digging speeds.
- Independent wheel control for straighter line trenching and turning corners.
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CONTRACTORS AND ENGINEERS

of the machine by the contractor. High turn-in value, he added, reflects the reliability and quality of the product.

The contractor's wants should also be decided by the analysis and pre-evaluation of equipment, according to Park. Figures on performance and costs are needed for such pre-evaluation, he stated, and contractors should analyze the claims of the various sellers according to several premises. As an example, he compared two different makes and sizes of self-propelled rubber-tire earth-moving machines used on the same job. According to the analysis chart (page 86), the higher priced machine was the better investment for the haul length indicated. On shorter hauls, the lower priced machine would improve its record.

Technical Sessions

The first day of the conference also included these technical papers: "The Need for a Test Code and Its Objectives" by H. L. Rittenhouse, manager, Product Engineering, Euclid Division, General Motors Corp.; "Discussion of Instrumentation" by T. Davidson, Bucyrus-Erie Co.; and "Results and Evaluation of Field Tests" by P. Spennetta, Caterpillar Tractor Co. The second and last day of the conference produced another technical paper, "Engine Requirements for Earth-moving Equipment" by K. M. Leech and J. A. Watts, Cummins Engine Co., Inc.

More contractor reaction to equipment was presented in a paper, "Downtime", by James W. Symonds of Peter Kiewit Sons' Co. The speaker defined downtime as all time that equipment is unable to work because of mechanical failures, time required for necessary maintenance such as lubrication and mechanical adjustment, time spent waiting for repair parts, time lost due to overly complicated repair and service methods, and time lost due to psychological factors. As an example of psychological downtime,

he cited a machine on the market which gives a man a hot oil shower when he pulls the drain plug, thus setting up resistance to the use of that particular make of equipment.

As for equipment designed for large loads and high speeds, Mr. Symonds suggested that these two favorable characteristics might be accompanied by an increase in downtime. In such cases, adjustments would have to be made for either the speed or load, or both, in order to keep downtime and cost of maintenance within bounds. The effect of downtime on costs, according to Mr. Symonds, is shown by: cost of repair parts, maintenance, and service supplies; cost of direct and indirect repair and service labor; and cost of loss of the unit's use.

Mr. Symonds urged the SAE men to give some thought to overly complicated repair and service methods. To illustrate, he cited a case in which it was necessary not only to remove the clutch, but also to dismantle the transmission of a unit in order to replace the front transmission oil seal. As another case of poor design, he mentioned a diesel engine equipped with a complicated oil filter. Each filter compartment contains four small parts that may be put in either right side up or upside down, or else may be lost in the dirt and forgotten during a service operation.

New equipment is often released with too many "bugs", Mr. Symonds declared. He suggested that manufacturers keep contractors posted as to the nature of these "bugs" so that the customer may be prepared to cope with the problems. Repair parts should be made nonreversible and foolproof. The goal of his company, according to the speaker, is to maintain a 90 per cent record of availability with all equipment.

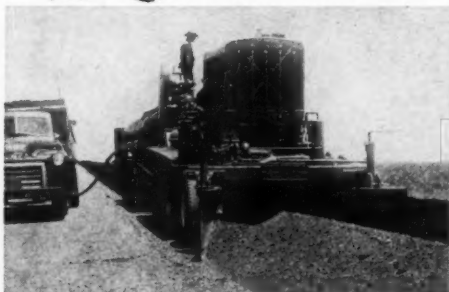
Front-End Shovels

The history of front-end shovels in the earth-moving industry was traced by J. B. Codlin, chief engineer.

(Concluded on next page)



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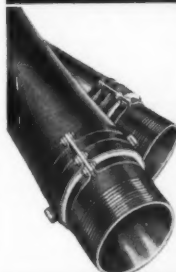
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(Continued from preceding page)

neer, Tractomotive Corp. He said this type of equipment is divided into two classes, the crawler type, called a shovel, and the wheel type, called a loader. Developments over the years have resulted in improvements in four ways: better balance, better visibility, full control of bucket, and better hydraulics.

In conclusion, F. D. Haberkorn, Caterpillar Tractor Co., presented a paper, "Engineering—Sales—Progress". He compared the cost of earth-moving in railroad construction some 50 years ago with its cost today. According to some specific job records, dirt-moving costs then averaged from 36 to 38 cents per cubic yard, while a present-day project under similar dirt conditions



The role of earthmoving in conservation work was treated at the conference by Harald T. Reishus, principal speaker at the opening session. He is vice president, International Harvester Co., Industrial Power Division.

goes for a price of only 17½ cents per yard. The lower price, the speaker noted, resulted from the tools developed by the engineers of our mechanical age.

Mr. Haberkorn reminded the conference of actual or near tragedy in the early life of some new machine, simply because its designer was more interested in defending the soundness of his original design than in finding a quick and effective way to adjust it to fit the desires of the customer.

Guest speaker at the annual banquet was Lieutenant General Eugene Reybold (ret.), executive vice president, American Roads Builders' Association. His topic was "Progress at Its Best".

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CONTRACTORS AND ENGINEERS

AVOID LEGAL PITFALLS

Unmarked Check Not Final Payment

THE PROBLEM: A subcontract to construct pile and caisson foundations for a sewer treatment plant specified, in effect, that the subcontractor's acceptance of final payment should release the contractor from existing and future claims. The contractor issued a check which the subcontractor cashed, but neither it nor an accompanying voucher bore any notation that it was a final payment. Could the subcontractor afterwards press a claim for damages based upon elimination of work called for by the subcontract?

THE ANSWER: Yes. (New England Foundation Co. v. F. H. McGraw & Co., 113 Fed. Supp. 246, decided by the United States District Court for Rhode Island.)

Subcontractor Delayed

THE PROBLEM: The general contract for construction of a factory plant contained detailed provisions concerning delays and a requirement that the work "be carried to completion with utmost speed". A subcontract did not specifically adopt those provisions but did provide: "Work is to be done at such time or times and in such manner and in such quantities as may be required by us [the general contractor] to meet our time schedule." Was the general contractor liable to the subcontractor for delaying performance of the subcontract, on a theory that the requirement for "utmost speed" in the prime contract became a part of the subcontract?

THE ANSWER: No. (Arrow Sheet Metal Works, Inc. v. Bryant & Det-

wiler Co., 61 N. W. 2d 125, decided by the Michigan Supreme Court.)

The court thought that the clause in the subcontract was intended to protect the general contractor against responsibility for delays that might be caused in the operation of other general contractors on the same job.

The court also said that the subcontractor could not avail himself of provisions designed to protect the owner against delays caused by the general contractor, the provisions

not serving to benefit subcontractors.

The opinion cites in support of its soundness a decision by the United States Supreme Court to the effect that certain provisions of a prime contract were not to be regarded as being part of a subcontract. (Guerini Stone Co. v. P. J. Carlin Construction Co., 240 U. S. 264, 38 Sup. Ct. 300, 60 L. Ed. 636.)

Borrowed Employees

THE PROBLEM: A city rented snow-removal equipment to a construction company for use on a project in which the city was not interested. A city employee was furnished to operate the equipment, and for the time being was transferred from the city's payroll to that of the company which controlled the details of

Edited by A. L. H. STREET Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

his work. While so employed, he was fatally injured. For workmen's compensation purposes, was decedent an employee of the company?

THE ANSWER: Yes. (Darvell v. Paul A. Laurence Co., 57 N. W. 2d 831, decided by the Minnesota Supreme Court.)

That the company paid the man's (Continued on next page)

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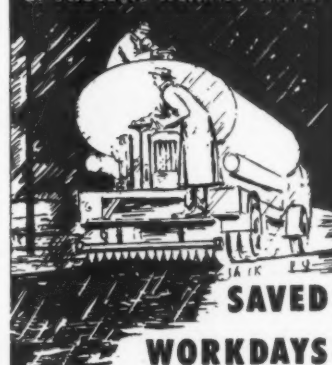


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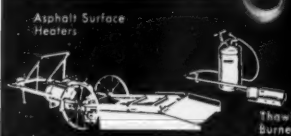


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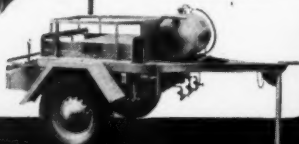
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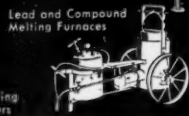
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(Continued from preceding page)

wages was a material circumstance, to be considered with other facts, but was not in itself conclusive as to who was his employer when he was injured.

Oral Modifications Of Written Contract

THE PROBLEM: A construction agreement is of such nature that it is not legally required to be in writing. It is, however, covered by a written contract which specifies that it can be modified only in writing. Can this written contract be changed by oral agreement of the parties, if they have fully performed the terms of the oral modifications?

THE ANSWER: Yes. (Heple v. Kluge, 250 Pac. 2d 694, decided by

the California District Court of Appeal.)

This is an application of the adage that "actions speak louder than words".

Changing Plans Ended Contract

THE PROBLEM: A contractor agreed to build a house for \$25,000, but after the foundation and first floor had been constructed, the owner insisted upon changes that would increase the cost considerably, and the parties could not agree upon the price to be paid for a completed job as changed. The contractor quit and sued for the value of work done. Did the owner have a good damage claim against him for what it cost her to have another contractor finish the job?

THE ANSWER: No. (Glazer v. Lerman, 116 N. E. 2d 569, decided by the Massachusetts Supreme Judicial Court.)

The court said that the changes insisted upon by the owner were such that the owner could not reasonably expect that they be made without an increase in payment, and failure of the parties to agree on a new price terminated the original contract, entitling the contractor to payment for what he had done on the basis of reasonable value. The decision on the last point seems to have been influenced by the fact that there was no showing as to just what extra expense the changes involved.



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Contractor Bound By Known Soil Condition

THE PROBLEM: A contractor's bid on a Government project was made on an assumption that sand would be used as fill, but the contract did not so provide. The contractor's president knew that the adjacent soil was mainly composed of oolite. The contract bound the contractor to investigate soil conditions. Was the contractor entitled to extra pay covering the cost of using the available soil over what would have been involved had sand been available?

THE ANSWER: No. (Chalker & Lund Co. v. United States, 107 Fed. Supp. 734, decided by the United States Court of Claims.)

Employee As Rider On Gravel Truck

THE PROBLEM: An accident policy issued to an employer covered members of a road crew while proceeding to work in a transportation conveyance provided by the employer. Did the policy cover the accidental death of an employee while boarding a gravel truck to go to a place where he was to work?

THE ANSWER: Yes. (Fomby v. World Insurance Co., 115 Fed. Supp. 913, decided by the United States District Court, Western District of Arkansas.)

Interest on Claims

THE PROBLEM: Dispute rose over the total amount due from a public agency for channel excavation. The agency offered the contractor a check for the part of the amount not in dispute, agreeing that acceptance should not bar right to claim more. Could the contractor, after rejecting

the check and on getting judgment for a larger sum, collect interest on the full amount from the date when payment was due?

THE ANSWER: No. (Broward County Port Authority v. Arundel Corp., 206 Fed. 2d 220, decided by the U. S. Court of Appeals, Fifth Circuit.)

Interest ran only on that part of the amount due which the public agency refused to pay without suit.

Railroad Cars Derailed

THE PROBLEM: Railroad cars loaded with slag were placed upon a side-track under control of a construction company for unloading. In moving some of the cars by gravity, the construction company's employees negligently permitted other cars to be derailed. Was the company liable

to the railway company for resulting damages?

THE ANSWER: Yes. (Atlantic Coast Line Railroad Co. v. J. B. Maynard Construction Co., 67 So. 2d 893, decided by the Alabama Supreme Court.)

The court noted that when a railway delivers cars to a shipper or consignee for loading or unloading, the latter becomes a custodian in such sense as to be bound to use such care to guard against injury to the cars as one of average prudence would use in caring for like property of his own.

Vibration Damage

THE PROBLEM: Vibration caused in pile-driving for a parochial high-school building damaged a house across the street, although the driving

was carefully done in a customary manner. (1) Was the contractor, his surety, or the subcontractor liable for the damage? (2) Were the owner of the high school and its insurer liable?

THE ANSWERS: (1) No. (2) Yes. (Bruno v. Employers' Liability Assur. Corp., 67 So. 2d 920, decided by the Louisiana Court of Appeal, New Orleans.)

Injury Award Was Excessive

THE PROBLEM: A subcontractor's crane operator was severely injured through collapse of a concrete wall behind which he was placing back-fill. A jury awarded him \$100,000 damages against the general-contracting company, on the ground that the accident was due to the latter's negligence. Was it excessive?

THE ANSWER: Yes. (McGillick v. Valcorte Construction Corp., 117 N. Y. Supp. 2d 886, decided by the New York Supreme Court, Appellate Division, Second Department.)

The court ordered a new trial on the ground that the damages were excessive, unless plaintiff should consent to a reduction of the award to \$60,000.

New Brunner & Lay Plant

Construction of a new plant and warehouse at Asheville, N. C., for Brunner & Lay Rock Bit Corp., Philadelphia, Pa., is under way, with William B. Dillard Construction Co., Inc., Sylva, N. C., general contractor. The new facility will provide space for expanded production of the company's rock-drilling, clay-digging, and concrete-breaking tools.



Think what
Flintseal* saves you
per mile of joints

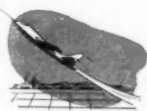
For mile after mile of trouble-free and economical concrete pavement joints, specify FLINTSEAL.

A rubber-asphalt hot-poured compound, Flintseal holds its bond and seals out water positively through all weather. Won't crack or fail in cold. Won't flow or smear in heat. Stays extensible and compressible through expansion and contraction of the pavement slabs. Remember, for every mile of pavement you have approximately two miles of joints.

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And specify FLINTSEAL JFR

(jet fuel resistant) to seal joints in critical areas on air fields.



Both FLINTSEAL and FLINTSEAL JFR meet State and Federal specifications.

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Over 50 Years Specialized Experience at Your Service . . . by 'phone, mail or personal call. No obligation.

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THE FLINTKOTE COMPANY, Industrial Products Division, 30 Rockefeller Plaza, New York 20, N. Y.; 55th & Alameda Sts., Los Angeles 54, Calif.

The Flintkote Co. of Canada, Ltd.—Toronto, Ontario



Attention Riggers!

Here's a complete line of dependable jacks for every lifting, lowering, or pushing job



5 TONS (No. 516 MT)	10 TONS (No. 1022)	15 TONS (No. 1522)	20 TONS (No. 2028)
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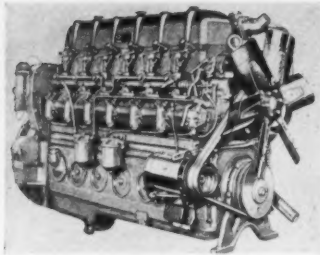
Every Duff-Norton Ratchet Jack is guaranteed at full capacity for loads applied to either head or foot lift!

Regardless of the job at hand, whether it's skidding a heavy piece of machinery, repairing an earth-moving machine, tractor, truck, bulldozer, lowering equipment and materials, there's a precision-made Duff-Norton ratchet jack of the correct size to do your job faster, easier and with less effort.

Duff-Norton ratchet jacks are designed and built to give long and trouble-free service with a minimum of maintenance.

See your distributor regarding detailed specifications on any of these jacks or write for your free copy of a new 40-page Jack Manual, Catalog No. 204-S listing the complete line. Write to the world's oldest and largest manufacturer of lifting jacks, the Duff-Norton Manufacturing Co., P. O. Box 1889, Pittsburgh 30, Pa. Canadian plant—Toronto 6, Ontario.

DUFF-NORTON
"Giving Industry A Lift
Since 1883"
Jacks



The P&H Model 687C-18 6-cylinder fan-fly-wheel engine is built also in 2, 3, and 4-cylinder units.

Greater Power Output For New Diesel Engines

■ Its improved line of two-cycle diesel engines features 36 per cent greater power output than earlier models, according to the P&H Diesel Engine Division, Harnischfeger Corp., 505 S. Main St., Crystal Lake, Ill. The company emphasizes the low ratio of weight to power in the new engines.

Horsepower ratings for the new models at 1,800 rpm range from 58 to 255. Displacement is 87 cubic inches per cylinder. The six-cylinder model weighs 1,800 pounds for 7.06 pounds per horsepower. The four-cylinder model weighs 1,500 pounds with 8.33 pounds per horsepower. For the three and two-cylinder engines, the figures are 1,190 and 975 total weight, with 9.30 and 12.50 pounds per horsepower, respectively. Compression ratio of all models is 16 to 1, and bore and stroke are 4.5 x 5.5 inches.

The cylinder assembly of the new engines has been redesigned for improved efficiency and longer service. More effective scavenging is reportedly achieved by a new valving arrangement and redesigned porting, which give greater turbulence.

Cooling capacity of the engines has been increased over former models through the enlargement of water passages and the addition of new channels in vital areas. The entire liner now receives uniform cooling. A special-alloy cast iron now used for the liners keeps vital surfaces wet with oil at all times.

For further information write to the company, or use the Request Card at page 18. Circle No. 648.

Reinforced Concrete Text

The fundamental principles of concrete design are contained in "Structural Design in Reinforced Concrete", published recently by The Ronald Press Co., 15 E. 26th St., New York 10, N. Y. The introductory chapter on concrete is concerned with the general theory and design of mixtures, concrete properties, and reinforced concrete.

Prestressed concrete and design for ultimate stress are discussed in two chapters which not only outline the general background, but also point to future developments in this field. Bending and direct stress are treated in a special chapter. Formulas are derived and used throughout the text. At the end of each chapter are problems based on principles contained in each section.

The book was written by Clifford D. Williams, consulting engineer, Patchen & Zimmerman, and Charles E. Cutts, Ph.D., associate professor of civil engineering, University of Florida. It sells for \$6 and can be ordered from the publisher.

Flexible-Shaft Grinder In Portable Model

■ A new, portable, flexible-shaft grinding machine is being produced by the Stow Mfg. Co., 443 State St., Binghamton, N. Y. Mounted on three legs with casters, the G40-C machine can be moved around easily on the job. It is available with either an open-type or totally enclosed ½-hp motor.

A 12-foot flexible shaft with a ⅜-inch core is used. The long length of the machine makes it suitable for use on ceilings as well as on walls. The manufacturer points out that with this machine on the job, a contractor does not have to tie up his vibrators for grinding.

For further information write to the company, or use the Request Card at page 18. Circle No. 512.

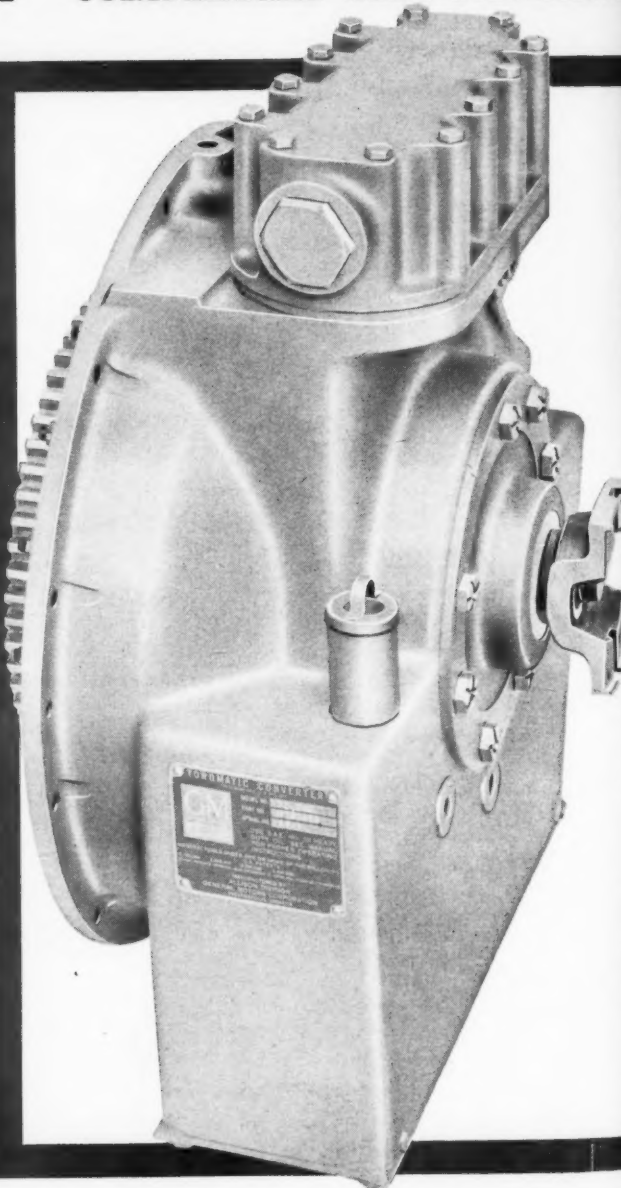
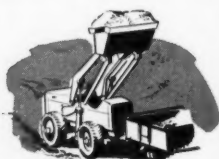
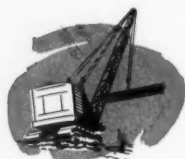
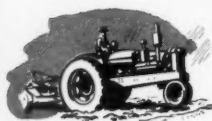
The new Stow Model G40-C flexible-shaft grinder is mounted on three legs with casters for easy moving on the job.



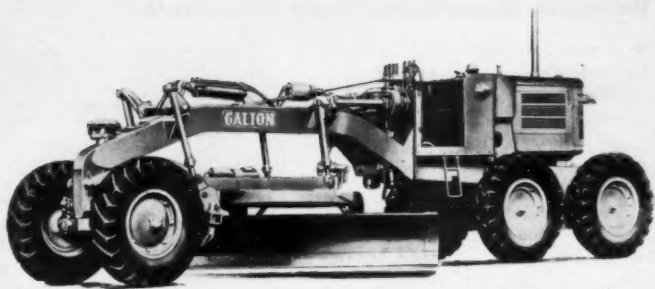
NOW LOW-COST HEAVY

EASY TO INSTALL

COMPLETELY SELF-CONTAINED



CONTRACTORS AND ENGINEERS



The Galion Model 450 grader features four-wheel drive and hydraulic steering.

New Motor Grader Is Tandem-Drive Model

■ An all-gear tandem-drive motor grader in a new medium heavy-duty machine is offered by the Galion Iron Works & Mfg. Co., Galion, Ohio. Specifications list the unit's weight, without scarifier, at 20,630

pounds or more, depending on extra equipment. The grader has a 75-hp IHC diesel engine and a new constant mesh transmission. Six overlapping forward speeds range from 1.1 to 20.1 mph, and there are two

reverse speeds of 1.3 and 8.4 mph.

The Model 450 grader has four-wheel drive. Gears have three-inch faces and are made of heat-treated nickel-alloy steel drop forgings. A two-piece rear axle is of full-floating design and, having a driving function only, carries none of the grader weight. Large low-pressure tires are supplied as standard equipment.

Hand steering with a hydraulic booster is also included as standard equipment. All blading and scarifying operations are under full hydraulic control. The new grader has a full 360-degree reverse turn circle and a 90-degree bank-cutting angle. Blade pressure is from 10,950 to 13,150 pounds, depending on extra equipment. With the standard 12-foot blade, reach outside the rear tires is 72 inches.

Available as extra equipment is a

12-foot hydraulic moldboard which permits a maximum extension of the blade 97 inches beyond the rear tires.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 535.

Up-To-Date Edition Of Machinery Manual

Both the basic and the most recent data and formulas pertaining to the field of mechanics are made available in the 15th edition of "Machinery's Handbook", published last month by The Industrial Press, New York, N. Y. Mechanical tables, rules, formulas, and general information on machine design and shop practice are included in its 1,911 pages.

New sections in this latest edition are devoted to spur and generated bevel gears; fine-pitch worms and worm gears; ball, roller, and needle bearings; various types of late-model small cutting tools, and data on new metal alloys. Complete tables on weights and measures, information on electric motor maintenance, and a comprehensive index are important features.

The book is designed as a handbook for mechanical engineers, draftsmen, tool makers, and machinists. The newest revised engineering standards are treated, along with data representing the latest design and manufacturing practice.

The authors are Erik Oberg and F. D. Jones, and the work has been edited by Holbrook L. Horton. Priced at \$9, "Machinery's Handbook" may be ordered from The Industrial Press, 148 Lafayette St., New York 13, N. Y.

Aids Help To Prevent Blasting Cap Accidents

Through the safety program conducted by the Institute of Makers of Explosives, contractors may obtain posters, displays, and a safety film on blasting caps, all without charge, as aids in preventing blasting cap accidents. While the number of such accidents has been reduced in recent years, the 1953 rate again showed an increase. The current volume of road building and other types of construction which require the use of dynamite means that the chances of such accidents are greater than ever.

The film and other materials can be had by writing the Institute of Makers of Explosives, 250 E. 43rd St., New York 17, N. Y.

HEAVY-DUTY TORQMATIC CONVERTERS

For 40-150_{HP} Gasoline- or Diesel-Powered Equipment

HERE, for the first time, are Allison TORQMATIC Converters designed for hard-working gasoline- or Diesel-powered equipment in the medium horsepower range.

These new torque converters are true heavy-duty units priced to compete with converters designed primarily for passenger cars—priced to sell for less than most comparable industrial-type converters.

And they fit your equipment with little or no change in your design.

Easy installation

New Allison TORQMATIC Converters are completely self-contained for simplified flexible installation—feature integral oil system including charging pump, oil cooler and oil sump. No

outside oil lines required. Integral gear drive for easy mounting.

Standard SAE #3 mounting dimensions and conventional internal-external drive gear like that used in ordinary clutch power take-offs simplify installation.

Three different models give you a wide selection of torque ratio and capacity. Options include front disconnect clutch and adapter, rear disconnect clutch adapter, standard flange as shown, industrial shaft with or without governor drive and oil cooler.

Why use a torque converter?

Your equipment lasts longer with an Allison TORQMATIC Converter transmitting power because it protects engines and driven equipment from

harmful shock loads—one of the main causes of equipment breakdowns.

And you get more work from your units, too. New Allison TORQMATIC Converters multiply engine torque up to 3½ times and also provide more production because they broaden your engine's effective horsepower range. When torque output equals load demand the TORQMATIC Converter acts as a fluid coupling to conserve fuel and boost engine life.

Ask your engine or equipment manufacturer about Allison TORQMATIC Converters for your hard-working 40- to 150-horsepower units or mail the coupon.



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Box 894C, Indianapolis 6, Ind.

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Position _____

Company _____

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Allison
TORQMATIC DRIVES



"Well, dat's da end of Butch—now to ditch da 'hot' truck."



Some of this year's AGC safety awards are presented to company representatives at the Annual Western Pennsylvania Safety Engineering Conference and Exhibit in Philadelphia. Left to right: Thurman C. Tejan, AGC executive secretary; Oren Hopkinson, Holmes Construction Co.; Carl J. Jacobsen, chairman of the association's accident prevention committee; Kenneth Gilkey, Burrell Construction & Supply Co.; Joseph Kissane, M. O'Herron Co.; and William Allardice, John F. Casoy Co.

Now... **BONUS PROFITS** from Your Loader on Every Job!

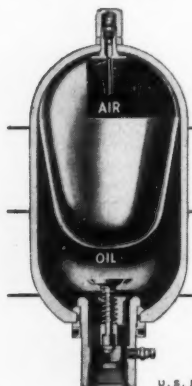
A Greer Accumulator Assures Faster, Smoother Operation by Reducing Shock on Your Loader

Hydraulic shock and vibration on bucket loaders can make the difference between profit and loss on your construction jobs. Shock usually means increased maintenance, slower loader operation, and operator fatigue.

But now — a simple, low-cost solution to this problem is the Greer

Accumulator. This revolutionary new-type shock-absorber takes the bounce and jounce out of your loader.

Actual field tests, successfully demonstrated to leading manufacturers and dealers, have proven the superiority of bucket loaders with a Greer Accumulator over all others.



U.S. PATS. UNDER OLDER LICHS.

Loader Owners! Benefit These 3 Important Ways!

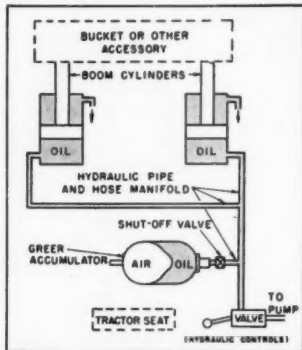
- 1. INCREASE PRODUCTION!** A Greer Accumulator smooths out loader performance so machine works faster. Gives better return on loader investment.
- 2. CUT DOWNTIME!** A Greer Accumulator absorbs shock that can damage parts and cause structural strain. Less maintenance means less costly downtime.
- 3. STEP UP OPERATOR OUTPUT!** A Greer Accumulator frees operator from tiring effects of jolts and vibration. Lets him work at his full capacity.

How the Greer Accumulator Works. The Greer Accumulator, above, is a steel shell encasing a rubber bag pre-charged with gas. Shock forces hydraulic fluid into shell compressing bag. Thus jolts are absorbed by the accumulator instead of jarring operator and machine.

Simple Installation. Typical loader circuit diagram is shown on right. A Greer Accumulator Tractor Kit only requires a hose and T-connection installed by any mechanic between the control valve and lift cylinders.

Act Now! For complete details on how the Greer Accumulator adds bonus profits to your construction jobs, see your equipment dealer, or write Greer today for more information.

GREER HYDRAULICS INC. • 454 EIGHTEENTH STREET • BROOKLYN 15, NEW YORK



Portable Shear Cuts Alloy Steel Bars

■ A new hydraulic cutter designed for cold-drawing operations and adaptable to forging bar cutoff requirements, is announced by the Manco Mfg. Co., Bradley, Ill. The complete 90-ton Model H-90 Guillotine shear weighs only 950 pounds.

The manufacturer reports that with this machine, a square cut is obtained on all types of steel bar up to 1½-inch round. Operation is electric-hydraulic, and the shear has a 2-second cutoff time. A complete cycle is performed by touching either the hand or foot switch.

Mounted on wheels, the compact machine may be moved for relocating or servicing. No concrete foundation is required. Its low over-all height, 48 inches, eliminates many problems of overhead space limitations when the machine is placed in a conveyor line. Interchangeable dies in ¼-inch increments are available.



The Manco Model H-90 hydraulic shear for cutting alloy steel bars.

For further information write to the company, or use the Request Card at page 18. Circle No. 644.

New Methods Simplify Clearing Operations

The use of new simplified procedures in clearing obstructions from reservoir areas on 22 major civil works projects has resulted in savings of approximately \$40,000,000, according to a report by the U. S. Army Corps of Engineers. The procedures grew out of studies and investigations by a committee appointed by the Corps.

The savings have been made possible by reducing manual labor and making greater use of mechanized equipment. Selective partial clearing instead of 100 per cent clearance is another economical procedure being used by the corps.

New mechanized developments for use in this operation include a crawler tractor and bulldozer with 6-foot pointed saw blade attached. The combination mows down 24-inch trees in one pass, and clears as much as ten acres in an 8-hour run. Another piece of equipment consists of an automatic free-flow bow chain

saw mounted on a special vehicle. This machine cuts through seasoned 17-inch beech logs at the rate of about one inch per second.

The mechanized developments replace the use of hand implements such as buck saws and axes, and do away with the greater manpower required by older methods of clearing.

Operating Advantages Of Finishing Machines

■ A portable finishing machine for highway and airport concrete-slab finishing is illustrated in literature from the Flexible Road Joint Machine Co., Warren, Ohio. The booklet gives operating details on the Flex-Plane Detroit Special, showing it at work on turnpikes and air strips.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 604.

Small Investment buys BIG LOADER performance!

For CLEATED or SMOOTH SHOE...LONG or SHORT TRACK CRAWLERS



HARDWORKING HEAVY-DUTY DOZER-LOADER

Fits TD-6, D-2, or Oliver A
ONLY \$1850.00
COMPLETE
TD-9, D-4 or HD-5
ONLY \$1925.00
COMPLETE
Also made for Oliver B

FULLY HYDRAULIC
Ideal for replacing
OLD HYDRAULIC
OR
CABLE LOADERS
PUT-ON...
TAKEN OFF
EASILY,
without modifying tractor!

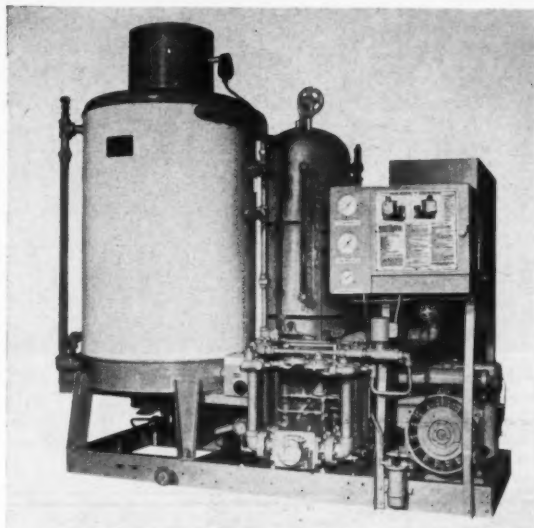
For full information WRITE TODAY!

Teale
AND COMPANY
P.O. Box 308, Omaha, Nebr.

CONTRACTORS AND ENGINEERS

New Steam Generator for Pile Hammers Has Steam-Cycling Control to Save Fuel

This McKiernan-Clayton steam generator, rated at 110 hp., is specifically designed for running pile hammers.



■ A steam generator for supplying power to pile hammers has been introduced by the McKiernan-Terry Corp., 15 Park Row, New York, N. Y. A complete steam-producing unit which operates automatically, the McKiernan-Clayton generator delivers full-pressure steam of less than one per cent moisture in three minutes from a cold start. The oil-fired steam generator is rated at 110 hp, and it is designed to operate up to and including a McKiernan-Terry double-acting 10B3 pile hammer and the S5 single-acting hammer and also the largest extractor, E4.

Fuel costs are reduced by an automatic steam-cycling control which assures that fuel is consumed only when steam is demanded by the load. In addition, the quick steaming feature cuts work time. Blowdown and drainage time is reduced from hours to minutes.

The steam generator, made by the Clayton Mfg. Co., El Monte, Calif., is easily operated. Starting, running, blow-down, stopping, and drainage

instructions and illustrations are mounted on the generator.

The design of the generator cuts repair costs in both hammers and the generator itself. By delivering steam of low moisture, the generator lowers the damaging accumulation of water in the valve and cylinder bores of the hammers. In the generator, less precipitate from the water is left to plug the coils, since high-temperature water is carried through the coils without substantially vaporizing into steam until it reaches the accumulator.

Weighing slightly over 4,000 pounds, the compact steam generator is easily handled. Its light weight and size reduce mounting and location problems. Unaffected by vibrations and motion, the steam generator may be used for mobile and marine installations.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 625.

New Steam Cleaner

■ A portable steam cleaner is made by the Turbo Machine Co., Lansdale, Pa. The Spontane steam cleaner features automatic water-level and pressure control. Hydro-Therm flow, a special preheating arrangement, reportedly makes it possible for the unit to convert cold water to 80 psi steam in 45 seconds.

Water is heated to approximately 180 F before it enters the tank. Cleaning compound is mixed by continuous agitation in the heated water. The unit operates at steam pressures from 80 to 125 psi, independent of city water pressure.

The construction of this steam cleaner reduces the hazard of fire because automatic ignition eliminates the use of matches or lighted torches. Drippings from the pumps



The Spontane steam cleaner.

and burner cannot drop on the floor where the machine is operated.

For further information write to the company, or use the Request Card at page 18. Circle No. 645.

Wherever
you build,

Ready-Mix Plants

can supply
air-entrained

Concrete

made with

Darex AEA



DAREX AEA is the world's most widely used brand of air entraining agent. Not a by-product, it is specifically formulated to do just one job; help you get superior results. Concrete made with DAREX AEA will save you money because it places easier, finishes faster and better, has finer surface texture, is more durable. Ask your nearby Ready-Mix plant for concrete made with DAREX AEA to insure the full benefits of air entrainment.



Construction Specialties Division

DEWEY and ALMY Chemical Company

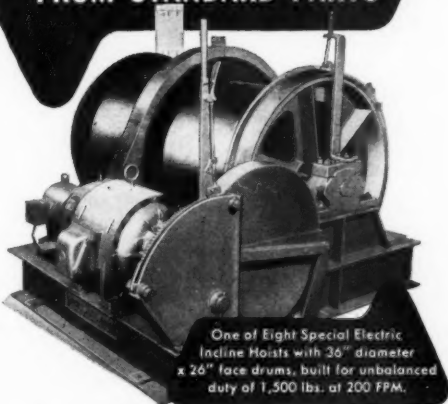
Cambridge 40, Mass.

OFFICES OR SUBSIDIARIES IN Buenos Aires, Chicago, Copenhagen, London, Melbourne, Milan, Montevideo, Montreal, Naples, Paris, San Leandro (Calif.), São Paulo, Tokyo.

DARASEAL concrete curing compound • DARACONE masonry water repellent • DARALITE for lightweight aggregate

Special Hoists

FROM STANDARD PARTS



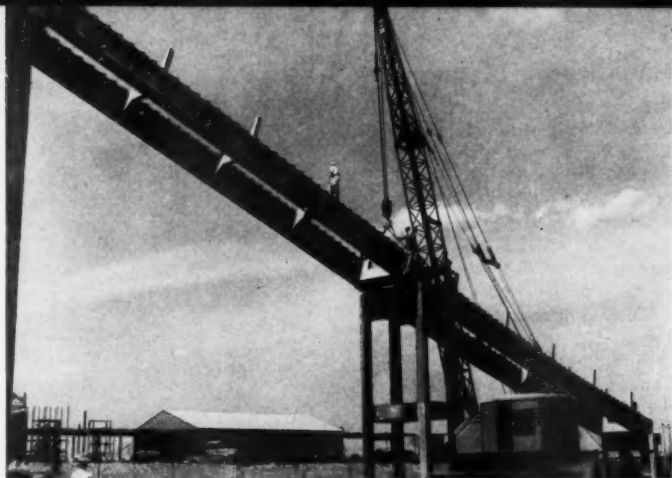
One of Eight Special Electric Incline Hoists with 36" diameter x 26" face drums, built for unbalanced duty of 1,500 lbs. at 200 FPM.

• By modifying and re-combining our standard parts, Superior-Lidgerwood-Mundy can engineer hoists to meet your specific requirements at the lowest possible cost.

WRITE FOR BULLETINS AND CATALOGS

SUPERIOR-LIDGERWOOD-MUNDY CORPORATION

Main Office and Works: SUPERIOR, WISCONSIN, U.S.A.
New York Office, 7 Dey Street, New York 7, N. Y.



Plant Conveyor—A PGH crane sets reinforced prestressed concrete members for a section of a 1½-mile gantry being built for a gasoline-from-coal synthesis plant in South Africa. Constructed under the supervision of Kellogg International Corp., the gantry will support conveyor belts carrying coal from mines to the plant.



Site Preparation—Caterpillar tractors and scrapers grade the site of the new 730,000-square-foot plant which will be built for the Caterpillar Tractor Co. at Decatur, Ill. Grading, being done by Jansen & Schaefer, Pekin, Ill., is expected to be finished in September. Steelwork is scheduled to be in place two months later.

Super-smooth for modern driving... *The New York State Thruway*



FLEXCELL* JOINT FILLER ASSURES TIGHTER, SMOOTHER, MAINTENANCE-FREE EXPANSION JOINTS

Anywhere concrete meets concrete, the call is for joints free of bulge and crevice, free from troublesome, expensive maintenance . . . joints that stay closed and smooth. And there's no better answer than Flexcell Bituminous Fiber Expansion Joint Filler.

Flexcell Joint Filler is tough, durable. Its resilient cane fiber base has millions of air cells which, when concrete expands, let Flexcell absorb pressure without extruding. As concrete contracts,

Flexcell springs back to keep joint closed and smooth.

Its easy handling and maintenance-free performance make Flexcell Joint Filler low in both initial and installed cost. It provides neat, finished joints without trimming. Protected by the patented Ferox® Process against dry rot and termites . . . impregnated with asphalt to resist moisture . . . made to stand toughest service, severest weather conditions.

No wonder Flexcell Joint Filler has for

so long been specified by leading engineers, contractors, and architects—as well as by the United States Army, Navy, and other Federal, State, and Municipal agencies. It'll pay you to consider the many Flexcell advantages . . . before you start your next job.

Mail the coupon below for full information on the benefits and economies of using Flexcell Joint Filler for pavements, runways, sidewalks, curbs, gutters, driveways, concrete floors. No obligation!

Another Famous **CELOTEX** Product

FLEXCELL

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BITUMINOUS FIBER EXPANSION JOINT FILLER

The Celotex Corporation, 120 S. LaSalle Street, Chicago 3, Illinois

*Flexcell is a Trademark identifying Bituminous Fiber Expansion Joint Filler marketed by The Celotex Corporation.

MAIL COUPON TODAY!

The Celotex Corporation, Dept. CE-64
120 S. LaSalle St., Chicago 3, Illinois

Without obligation, please send me complete data on Flexcell Bituminous Fiber Expansion Joint Filler.

Name

Address

City Zone State

Flood Control Controversy Is Subject of New Book

Present and recommended programs of flood control of the Corps of Engineers and the Department of Agriculture are described critically and in detail in "The Flood Control Controversy", by Luna B. Leopold and Thomas Maddock, Jr., hydraulic engineers. Dr. Leopold is with the U. S. Geological Survey doing scientific research on river problems, and Mr. Maddock is chief irrigation analyst for the Hoover Commission.

Sponsored by The Conservation Foundation and written with the cooperation of the Department of Agriculture and the Corps of Engineers, the book attempts to insure accuracy and impartiality in evaluating the progress of these agencies. The authors also draw on government and technical publications for information to assess the effectiveness of dams and watershed management in controlling floods. The federal interest in flood control, the question of local participation, and ways of getting more protection for the flood control dollar are also discussed.

"The Flood Control Controversy" is published at \$5, and copies can be obtained from The Ronald Press Co., 15 E. 26th St., New York 10, N. Y.

Onan Expands Department

The sales promotion department of D. W. Onan & Sons, Inc., Minneapolis, Minn., has been expanded to include the advertising responsibilities of the firm. George Burda, sales promotion manager, will direct the combined department. Assisting him will be Julius P. Grabow, assistant sales promotion manager; Russell V. Petersen, and Virgil C. Gilbertson. The company manufactures electric generating equipment.



Jobs Done Quicker, Cheaper

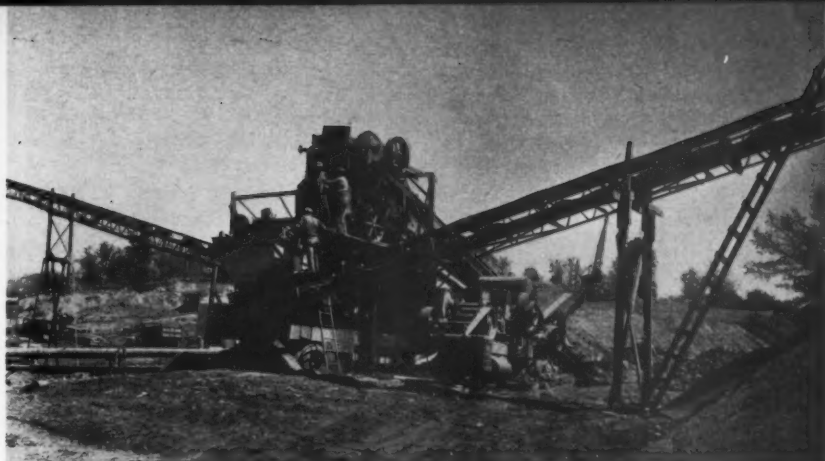
Attached to Tractors, Bulldozers, Motor Graders and Scrapers, the Automatic Slope-Meters are in use on the construction of highways, airports, dams and building sites. Slope-Meters are compact, sturdily constructed instruments that will automatically show the operator the exact grade of slope on which he is working.

Order from Your Equipment Distributor Today
THE SLOPE-METER CO. OR EXCELSIOR, MINN.

CONTRACTORS AND ENGINEERS



Road Construction—A 3-inch stabilized gravel lift is compacted on a section of U. S. 8 between Center City and Taylors Falls, Minn., by a Minneapolis-Moline Model U tractor with double drum Bros sheepfoot roller. Behind it, a Caterpillar No. 12 motor grader shapes and levels the surface. The lift was topped by a new



9-7-9 inch concrete pavement. Aggregate was produced by the crushing, screening, and washing plant, above, which consisted of a Diamond jaw and roll crusher and Simplicity 3-deck vibrating screen. A Waukesha 100-hp gasoline engine drives the crusher, and an International UD9A diesel engine powers the rolls.

GRACE



3 sweeper models, axle, engine or tractor powered.



Sheepfoot Rollers
250 to 600 psi.

GRACE Asphalt and Compaction Equipment



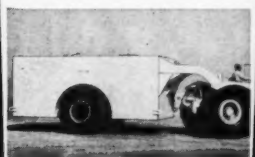
Rapidspray Maintenance Distributors.
Also heaters for production melting
of barreled asphalt.



Rapid Fire circulating heaters heat and
unload large tanks of asphalt.



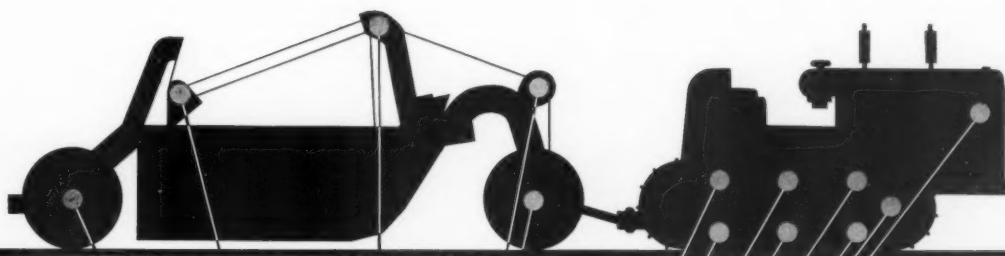
Chip spreaders 8' to 12' width. Also
asphaltic concrete spreaders.



Pneumatic rollers 7 to 50 tons.

W. E. GRACE MFG. CO.

now 1 grease replaces 7



NEW STANDARD LITHIUM MULTI-PURPOSE GREASE

● Here is a true multi-purpose grease that can be used practically anywhere on the job or in the shop. With new STANDARD Lithium Multi-Purpose Grease you can effectively lubricate all normally encountered grease-lubricated bearings with just one grease! No need for keeping old-fashioned special-grease inventories with complex dispensing equipment . . . no chance of costly application mistakes.

New STANDARD Lithium Multi-Purpose Grease is water and high-temperature resistant and can be used in mechanically and hand-operated dispensers and in grease cups. It replaces such greases as viscous lubricants, water pump grease, wheel-bearing grease, cup and fiber greases and can be used for general chassis and lubrication of a wide variety of bearings—ball, roller, plain, needle—under wet and hot operating conditions. Meets rigid requirements of wheel bearing manufacturers.

Now you can reduce grease inventories, eliminate waste, do away with costly application errors with STANDARD Lithium Multi-Purpose Grease. Ideal for fleet operators, contractors, other large-scale users of heavy automotive equipment. Call your nearby Standard Oil lubrication specialist now.



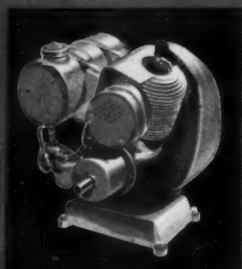
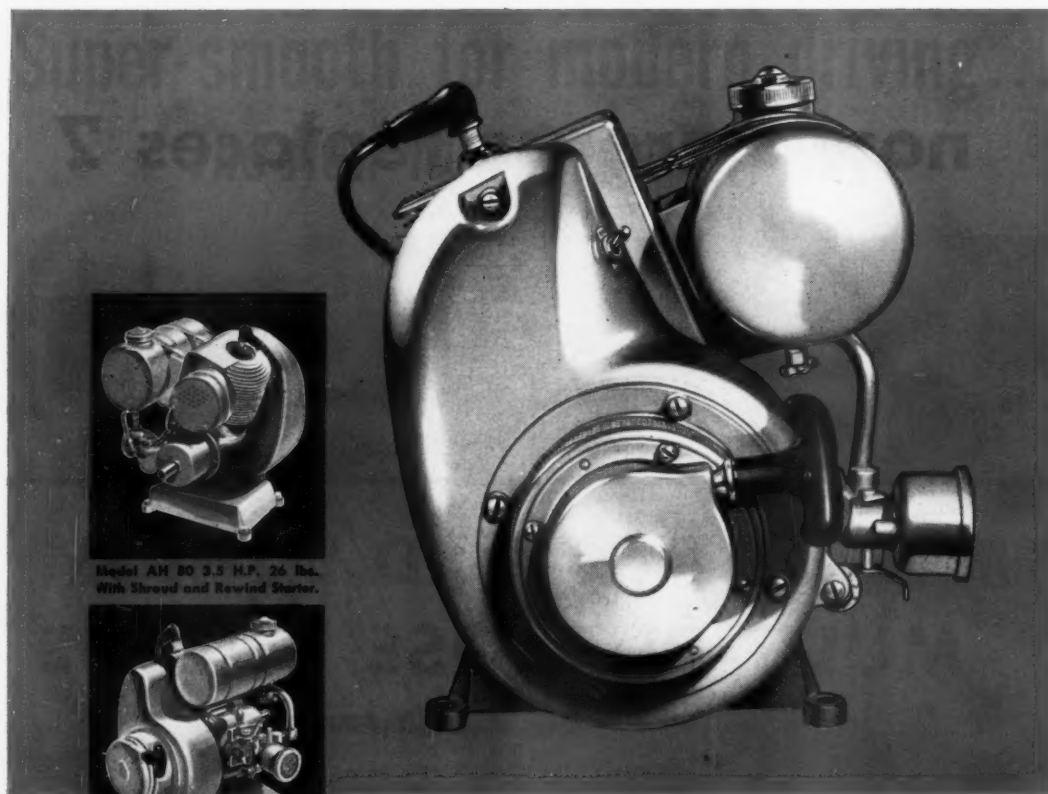
STANDARD OIL
COMPANY (Indiana)



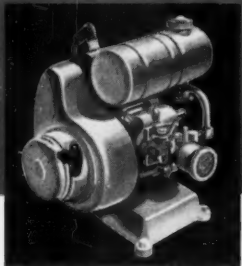
Drilling Footings—The McKinney Drilling Co., Nacogdoches, Texas, sinks footings for the \$277,000 high school gymnasium in Chattanooga, Tenn., with a Hugh B. Williams rotary drill. Holes, from 10 to 35 feet deep, vary from 2 to 5 feet in diameter. Bell sections in the shafts are up to 11 feet 4 inches in diameter.



Earthwork for Refinery—Working in a confined area, a Terratrac Model GT-25 backfills around tower footings at Standard Oil Co.'s new refinery, Mandan, S. Dak. The Lummus Co., New York, N. Y., is the general contractor for the facility, which will be able to process 30,000 barrels of crude oil daily.



Model AH 80 3.5 H.P. 26 lbs.
With Shroud and Rewind Starter.



Model AH47 — 2 H.P. 17 lbs.
With Shroud and Rewind Starter.

POWER PRODUCTS ANNOUNCES a new line of industrial engines

THERE is no other industrial engine on the market today comparable to this new Power Products engine. It is lighter in weight—more compact in design—requires less effort to start—is simpler to service than any other industrial engine. The design of this engine is the result of adapting to the industrial field many of the principles incorporated in the nationally known Power Products lawn mower and chain saw engines.

These famous engines were used on over 50% of all small rotary lawn mowers in 1953 and by every

major chain saw manufacturer who purchased engines. The features these engines offered—lightweight and easy starting for lawn mowers—sustained performance at high speeds and heavy loads for chain saws—are combined in the new industrial engine.

If you make or use any industrial product that requires power in the range of 2 to 4 horsepower, it will pay you to investigate this engine. It can add important advantages to your product. Write today for complete specifications.

POWER PRODUCTS CORPORATION

GRAFTON, WISCONSIN



North African Base Nears Completion for Air Force

Enlargement and improvement of Wheelus Field, U. S. Air Force Base in North Africa, is now more than 85 per cent completed and is scheduled to be finished early next year. Located near Tripoli, in Libya, this Mediterranean base has been active since World War II. Current construction, estimated to cost \$60,000,000, was begun in 1951.

Paving work includes construction of two 11,000-foot runways, with a 1,000-cut overrun at each end, and more than 100 acres of parking apron. In addition, 30 barracks, each capable of accommodating 200 men, as well as underground storage tanks, refueling platforms, a school, hospital, and chapel are being constructed at the base. Work is being done by William L. Crow Construction Co. and J. Rich Steers, Inc., both of New York, N. Y., and Shepherd Construction Co., Inc., Atlanta, Ga. The combine has offices in New York City.

The base is built on a 10-foot layer of sand which had been de-

DURING

1 day

A **B-G** RUNABOUT DITCHER

covered **53** miles

while digging 

2320

feet
of 5½" x 36" trench

see your B-G distributor
or write

Barber-Greene

AURORA, ILLINOIS, U. S. A.

CONTRACTORS AND ENGINEERS



City Highway—Rising above the streets of downtown Boston are some of the 16,000 tons of steel erected for the Fitzgerald Expressway by Bethlehem Steel Co., Bethlehem, Pa. The \$25 million highway, being built by the Massachusetts Department of Public Works, will have heated ramps to make winter driving safe.



Jones Beach Jetty—A trench is excavated to the surf by Allis-Chalmers HD-14 and HD-7 bulldozers as a new jetty is begun at Jones Beach Inlet on Long Island, N. Y. Large boulders will be set in place to carry the jetty a half mile into the Atlantic. J. Rich Steers, New York, N. Y., is doing the work for the U. S. Army Corps of Engineers.

posited over limestone and marl through the centuries. After drifted sand had been cleared away, the level area was covered with two 8-inch layers of crushed stone. After being rolled with rubber rollers, this was topped with a 6-inch asphalt pavement.

To do this work, the contractors brought 78,882 tons of supplies and materials from the U. S. in 96 vessels. About 3,000 workmen, excluding employees of subcontractors, are on the job. Working with complements of experienced American men are workers recruited from North Africa, Southern Europe, and the Near East, most of whom were given intensive on-the-job training. Edward J. McManus of the Crow organization was superintendent of construction for more than two years. When he returned to the U. S. last December, supervision was taken over by the general superintendent of the reservation.

Insure your own personal security and that of the nation by regular investment in U. S. Defense Bonds.

Why do contractors *prefer* **PAYLOADER[®]** TRACTOR SHOVELS?

compare these two items

ORDINARY TRACTOR SHOVEL

3/4 Yd. tractor shovel, nearly new, used only 4 mo's. Will sacrifice for half price. Phone [redacted] as announced in the auction among [redacted]

The above newspaper classified ad appeared in March, 1954.

PAYLOADER TRACTOR SHOVEL

Top price at the Auction Sale among used tractor shovels was for a HOUGH Model HF "PAYLOADER", 2 1/2 years old, which brought 68% of its original price. The unusually high price came as a complete surprise to even the auction officials. Will nearly half [redacted]

The above report appeared in an April, 1954 publication.

Wise tractor-shovel buyers know there's more value in a "PAYLOADER" when it's new and that it'll bring more when they sell it. They know that The Frank G. Hough Co. has pioneered MORE developments and MORE improvements in tractor-shovels than all other manufacturers put together.

Further proof of "PAYLOADER" value is evidenced by the fact that you will seldom find a used one for sale — even though more "PAYLOADER" machines have been built than all other makes of unit-design tractor-shovels combined.

So, when you want maximum value and PROVEN PERFORMANCE in a tractor-shovel, you'll be wise to buy a "PAYLOADER". A complete range of sizes and models from 12 cu. ft. to 2 cu. yd. bucket capacity. Your nearby "PAYLOADER" Distributor is ready to serve you. The Frank G. Hough Co., 762 Sunnyside Ave., Libertyville, Illinois.



This is a Model HF "PAYLOADER" tractor-shovel like the one that brought top price in the Auction Sale quoted above.

You can't compete if your equipment is obsolete.



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CONSTRUCTION**

**CAISSONS
SHAFTS**

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UNDERREAMED

PIERS

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PROBLEMS

Wire or phone for a quotation
on your next foundation job —
ANYWHERE IN THE WORLD

McKINNEY

DRILLING COMPANY

NACOGDOCHES, TEXAS

Phone: 1195-1053 • P. O. Box 190



Steel and Concrete for Buildings—Derricks loom over steelwork on the new 41-story mid-American home office of the Prudential Insurance Co., in Chicago. The first major office structure to be built in the city for a number of years, it is slated for occupancy in 1955. The American Bridge Division of the U. S. Steel Corp. is fabricating the 31,000 tons of steel being used in the 600-foot-high framework. The George A. Fuller Co.,



New York, N. Y., is the contractor on this building and on the 15-story Statler Hotel, above, a reinforced concrete structure nearing completion in Hartford, Conn. Lightweight Sealuxe curtain walls permit the building to cantilever 15 feet over the sidewalk.



Wire Rope at Work—The Normanskill Creek Bridge, just south of Albany, is one link in the great New York State Thruway, a superturnpike from New York City to Albany, then west across the state. When this photograph was taken, the final gap was being closed in the 623-ft bridge, which spans both the Normanskill Creek and a railway right-of-way. D. A. Collins was the general contractor.

Here, as at so many other points along the route, Bethlehem wire rope was right in the thick of things. For hoisting the structural members, 6 x 25 Purple Strand Form-Set was used, and the rope proved a strong and able worker—just as it always does on lifting and hauling jobs in every type of industry.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation, Export Distributor: Bethlehem Steel Export Corporation

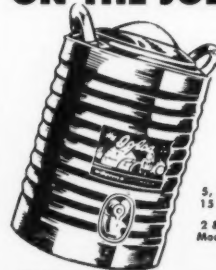
Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:
CONSTRUCTION • PETROLEUM • MINING • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING



FOR Cool EFFICIENCY...



ON THE JOB...



5, 10 or 15 Gal. Sizes
2 & 3 Gal. Models Available

GET Extra Strength IGLOO

Water Coolers



5 Gal. Utility Model

- Corrugated—3 times as strong
- All galvanized steel with double-lock seams
- Outlast barrels, save ice
- Recessed, drip-proof spigot

Ask your distributor or write:

Bettis CORPORATION
320 South 66th St. Tel. Yukon 5401
P. O. Drawer 9365 Houston 11, Texas

CONTRACTORS AND ENGINEERS



Steel and Concrete for Bridge—A heavy girder for the Paseo Bridge at Kansas City, Mo., is picked up by a Bay City 150-ton locomotive crane, above and transferred to a barge which will bring it to the erection point. The bridge is the longest self-anchored bridge in the country. Span measures 308, 616,

and 308 feet and the towers rise 186 feet above low water elevation. Designed by Howard, Needles, Tammen & Bergendoff, New York, N. Y., and Kansas City, Mo., the bridge is part of a \$16 million expressway project. Above, a crew builds forms for the concrete deck as the American Bridge Co. assembles steel for the span.

Army Builds Versatile Engine-Generator Set

An engine-generator set that will do the work of four old-type sets has been designed by the U. S. Army Corps of Engineers at its Engineer Research and Development Laboratory, Fort Belvoir, Va. By means of a simple adjustment, the set can be made to supply four different types of electric power.

The Corps of Engineers is also testing interchangeable attachments for the three most common types of bulldozers used by the armed forces. A number of attachments already have been proved interchangeable and are now being tested under actual operating conditions.

These and other tests are being conducted by the Corps of Engineers as part of a program to standardize

mechanical and electrical equipment used by the military. Results of efforts to standardize industrial gasoline engines were shown at a recent exhibit at the Pentagon.

Work on 138 engine models of 3 to 4-inch bore sizes has already been completed, and 59 interchangeable parts for these models now serve where 1,187 separate parts were previously required. The corps hopes to reduce the number of small air-cooled gasoline engines from 78 to 7 with development of a complete new military family of such engines.

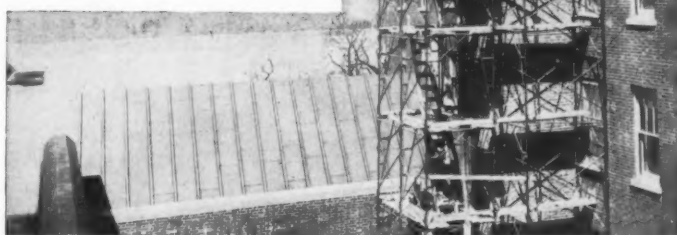
Gas turbines, piston rings, valves, bearings, and other high-mortality parts also are being studied for maximum interchangeability.

Sign up before it happens! Civil Defense needs you for wardens, police, and first aid.

Who's Selling What . . . HERE?

LISTEN MEN . . . we almost mean it literally when we say: "We're not out to sell just Scaffolding to you." Frankly, we've got an idea to sell—an idea on 'how-to' erect better scaffolding—'how-to' *do the job cheaper!* The man we sold on this job, bought our idea of using 6½ ft.-high Ezebilt panels—cut 50 panels out of his needs and saved almost one third in erection time alone. THIS is what we're in business for—to provide you with not only the best scaffolding made, but also the best way to use it. Our new catalog pictures and tells many more reasons why you should buy Universal Ezebilt Scaffold.

Write for our New Informative Scaffolding Catalog



Distributors offer planning help and fast deliveries from Sales and Rental Stocks . . . See your phone directory

UNIVERSAL MANUFACTURING CORP., Zelienople 1, Pa.

MORE CONCRETE BREAKAGE

Less man hours!

COMPARATIVE PERFORMANCES OF SABUR POINT AND CONVENTIONAL POINT

Conventional Moll Point

Tools begin breaking concrete.

Two inches into concrete. The conventional moll point ends its breaking action. SABUR Point's unique wedge-action continues to shatter concrete.

Six inches in. Conventional moll point is simply cutting a hole. The SABUR Point continues its breaking. Wedge-point permits tool to continue its penetration with point riding free. Stays sharper 3 to 5 times longer than conventional tool.

Side view of SABUR Point
(Reg. U. S. pat. off.)

...with SABUR POINT

5" Asphalt Cutter

3" Chisel Bit

Lowest end-of-service cost is what counts in tools. Brunner & Lay Tools give it. They are backed by 72 years of service to the construction field. Write plant nearest you for new, illustrated bulletin TCE-11-3.

Brunner & Lay, Inc.

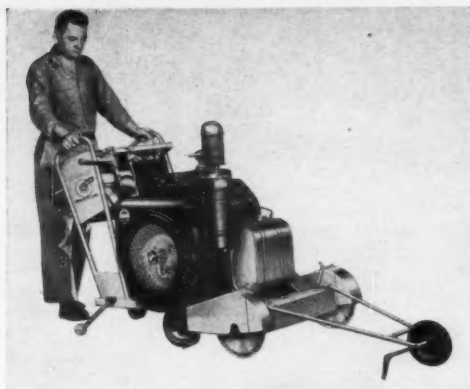
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Affiliated plants and warehouses

Brunner & Lay Rock Bit Corp. 2514 E. Cumberland St. Philadelphia 25, Pa.	Brunner & Lay Rock Bit Corp. 350 Depot St. Asheville, N. C.	Brunner & Lay, Incorporated 2425 East 37th St. Los Angeles 58, Calif.	Brunner & Lay, Inc. 150 Leslie St. Dallas, Texas
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JUNE, 1954

101



The new Target concrete saw features hydraulic blade control.

Concrete Cutting Saws Have Hydraulic Control

■ Four new hydraulically operated concrete saws have been announced by the Robert G. Evans Co., 7204

Wyandotte St., Kansas City 14, Mo. Ranging in power from 15 to 36 hp, the Target saws are powered to

handle a wide range of concrete and asphalt-cutting operations.

The chief feature of the saw is its hydraulic system, which lowers the blade into a cut by pump action. This eliminates any possibility of the blade being dropped suddenly since the operator has positive control at all times.

Two rigid 8-inch wheels, mounted forward and close to the blade, protect against deflection and hold the blade squarely in the cut. The pivot wheel provides 3-point suspension to eliminate twisting leverage on the blade from rear frame movement over rough surfaces. A further advantage of this design is maneuverability.

All models in this line have a dual-arbor blade shaft, so that the blade may be mounted for either right or left-hand cutting. Both the

Model 360 and Model 150 saws are available with either manual or electric starter systems.

For further information write to the company, or use the Request Card at page 18. Circle No. 619.

Data on Highway Mower

■ A rotary mower with power take-off is shown in literature from the Worthington Mower Co., Stroudsburg, Pa. The bulletin gives details and specifications of the new Model 72 twin-blade rotary mower. The new mower may be used with a Worthington Model G tractor or with any two-plow tractor with power-takeoff drive.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 646.

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A COMPLETE SYSTEM

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Move a Mountain



or Push
Some
Pebbles

Whatever the job, there's a SHUNK blade designed to do it efficiently and economically. For almost a century SHUNK has been manufacturing a full line of fine cutting edges rolled from top-quality steel to fill any maintenance or construction need . . . whether it's gravel, dirt, shale, snow or rocks.

Original equipment manufacturers specify them because of their durability . . . contractors use them because of their dependability . . . distributors like to sell them because they're priced right and deliveries are prompt.

Write us for recommendations on the proper SHUNK blade for your job.

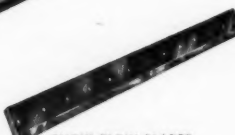
3,000 DIFFERENT SPECIFICATIONS



SCARIFIER BLADES



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Shunk MANUFACTURING COMPANY
In Our 99th Year

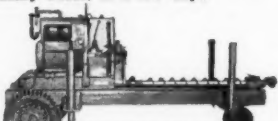
BEST BLADES MADE

LEADING CONTRACTORS USE McCarthy Drills



PUBLIC UTILITY AUGER DRILL

Bores holes from 4 1/2" to 24" in diameter under sidewalks, roads, building foundations, railroad tracks, landscaped grounds, etc. Fithian Contracting Co., Youngstown, O., using McCarthy Public Utility Auger Drills, completes pipe line jobs, formerly taking weeks, in a few days.



SELF-PROPELLED HORIZONTAL AUGER DRILL

Will bore 6" and 8" diameter holes 120 feet horizontally at rate of six feet per minute maximum. Four individual, self-locking jacks maintain correct drilling level. In one day a New Castle, Pa., operator bored holes of various depths totaling 840 ft. through shale and sandstone, using this McCarthy Auger Drill.



VERTICAL AUGER DRILL

Operating men who have made actual on-the-job tests find the McCarthy Vertical Auger Drill a standout for mobility, stamina, ruggedness and versatility. On a 2-million dollar, 5-mile stretch of superhighway between Hubbard, Ohio, and Sharon, Pa., The Apex Powder Co., Canton, Ohio, cut blasting costs approximately 20% as compared to air, well or churn drilling. Cutting through two large areas of concentrated rock, 150 holes 15 feet deep were bored for each blasting pattern. 3,000 cubic yards of sand rock were moved at each blast. Due to the ruggedness and mobility of McCarthy Drills, there was no time lost. For further information, write Salem Tool Co. and our distributor will contact you.



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SINCE 1901

THE SALEM TOOL CO.

806 SOUTH ELLSWORTH AVE.
SALEM, OHIO • U.S.A.

CONTRACTORS AND ENGINEERS

The Speed Batch Model 2000 asphalt plant recently announced by the Universal Engineering Corp.

Asphalt Plant Features Operating Flexibility

■ A new 2,000-pound-capacity asphalt plant has been introduced by Universal Engineering Corp., 620 C Ave. N. W., Cedar Rapids, Iowa. The Speed Batch is an all-electric plant and features central push-button controls. Controlled batch aggregate drying permits complete control over every batch.

The plant will turn out a production run or a single batch, as required, and all types of asphalt mixes can be produced. Many types of products can be run through the plant in one day without the usual changeover loss of time. Progression indicator lights and signals eliminate guesswork and enable the operator to speed up the production cycle.

The dryer, pugmill, dust collector, and all power components and controls for their operation are combined on one compact frame as a unit. This unit is equipped with a removable operator's platform, lifting hooks, and a folding stack for ease in transport and erection. The plant is also available as a portable unit mounted on a steel gooseneck truck with pneumatic tires.

Capacity ranges from 25 to 40 tons per hour, depending upon the moisture content of the feed material and the type of mix.

For further information write to the company, or use the Request Card at page 18. Circle No. 545.

Lightweight Chain Saw

■ A new 3-hp chain saw has been announced by Lancaster Pump & Mfg. Co., Inc., P.O. Box 778, Lancaster, Pa. The lightweight Model



318 is equipped with a standard 18-inch blade and an Oregon chipper chain. It is also adaptable to 16, 20, 26, and 30-inch blades.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 647.

Miller SWIVEL

"HEADACHE BALLS"

Overhauling weights for single lines (62#-450#). Attached to Miller Ball Bearing Swivel for perfect load lifting control. Compact for extra head room. 7 models. 5 tons to 20 tons capacity.

Let us work with you to adapt Miller Swivels to your particular needs. Write for Catalog and Prices

GENERAL MACHINE and WELDING WORKS, Inc.
P. O. BOX 938, POMONA, CALIFORNIA



New Welding Studs

■ Improved welding studs that provide strong, corrosion-resistant fasteners for corrugated asbestos, steel, aluminum, flat asbestos, and insulation are made by KSM Products, Inc., 321 Woodland Ave., Merchantville, N. J. These new KSM fasteners are particularly suited for use in curtain-wall construction.

All stud-welding applications are from the top side of the roof or the outside of the wall. No interior scaffolding is required.

For further information write to the company, or use the Request Card at page 18. Circle No. 519.

New Small unit ... DOES A BIG JOB!

Whiteman **QUALITY!**
...IN A **SMALL UNIT!**
...AT A **LOW PRICE!**

BRAND NEW!

WHITEMAN Model "M" TROWELING MACHINE

Now even *small* concrete finishing jobs can be done faster, more efficiently, more profitably by machine! The brand new Whiteman Model "M" Troweling Machine is a *small* unit that does a *big* job. 29" trowel diameter permits use in crowded areas while giving adequate coverage for smooth, level finishing and efficient operation. A quality product of Whiteman, pioneer and builder of the first successful troweling machine...a result of 17 years experience and good, sound engineering. Ask your Whiteman distributor about the new Model "M."

- **EASY OPERATION.** Even an amateur can do a good finishing job with the Model "M"
- **LIGHT WEIGHT.** Makes it possible to get onto the slab much sooner than with any other machine.
- **EXTRA POWER.** Famous Continental engine. Surplus power permits floating or finishing at very slow or high speeds, as desired.
- **COMBINATION TROWELS.** Can be used for both floating and finishing by simply adjusting pitch.
- **RIGID TROWEL ARMS.** Reduce wear at base and assure perfect trowel alignment.
- **ADJUSTABLE PITCH.** Trowel pitch adjustable by knob at top of handle with machine in motion. (Exclusive Whiteman Feature.)



PROFITABLE
EVEN ON
SMALL JOBS!



POWER
SUGGEST

Whiteman



SCREEDING
MACHINE

THE LEADER IN CONCRETE EQUIPMENT

WHITEMAN MFG. CO., DEPT. C
3249 Casitas Ave., Los Angeles 39, Calif.
Please send prices, literature and name of distributor for ☐ Floating-finishing machines, ☐ Screeding machines, ☐ Power Buggy.

Name _____
Firm _____
Address _____
City _____
Zone _____ State _____

DISTRIBUTOR DOINGS

West Coast Dealers for Aeroil

Exclusive distributorships in Oregon and California have been announced by Aeroil Products Co., Inc., South Hackensack, N. J., manufacturer of general contractors equipment.

One of the larger dealers in the northwest, Nelson Equipment Co. of Portland, Oreg., and Seattle, will cover Oregon and the western section of Washington. Its Portland office is at 5251 S. E. McLoughlin

Blvd., and its Seattle office is at 3706 Airport Way.

Brown-Bevis Industrial Equipment Co., 4441 Santa Fe Ave., Los Angeles 58, Calif., will serve an area in the southern part of California.

N. Y. Distributor for Clark

United Tractor & Equipment Corp., 135 E. 146th St., New York, N. Y., has been appointed to sell and service the Michigan line of power shovels and tractor shovels, products of the con-

struction machinery division of Clark Equipment Co., Buchanan, Mich.

The territory assigned to the firm consists of the New York counties of Westchester, Bronx, New York, Richmond, Kings, Queens, Nassau, and Suffolk.

The power shovels were formerly manufactured by the Michigan Power Shovel Co., while the new tractor shovels were recently developed and introduced by Clark.

Straub Mfg. Appoints Dealer

Garlinghouse Bros., Los Angeles, Calif., has been named the southern California distributor for Straub Mfg. Co., Oakland, Calif., manufacturer of Kue-Ken crushers. The dealer will handle the entire Kue-Ken line, from single crushers to complete crushing plants.

New Distributors for Gar Wood

Gar Wood Industries, Inc., Wayne, Mich., recently appointed four firms to its distributor organization. Hi-Way Equipment Co., Houston, will serve Texas counties in its trading area, while Gopher Equipment Co., Minneapolis, will cover the Minneapolis area. Both organizations will handle the Gar Wood line, which includes 3/4-yard excavators, Buckeye ditchers, spreaders, and finegraders.

Serving a territory which includes northern Illinois and northwestern Indiana is C. C. Fuller Co., Chicago, Ill.

Hoists, bodies, and other equipment manufactured by St. Paul Hydraulic Hoist, Minneapolis, Minn., a division of Gar Wood, are being distributed by Florig Body Works, Norristown, Pa. The dealer covers the Pennsylvania counties of Bucks, Montgomery, Chester, and Delaware.

Two New Lima Distributors

The construction-equipment division of Baldwin-Lima-Hamilton Corp., Lima, Ohio, has appointed two new distributors to handle its line of Lima shovels, cranes, draglines, and pull shovels. The Bradley Equipment Co., 1042 W. Marietta St. N.W., Atlanta, Ga., will represent the manufacturer in the central and northeastern portions of Georgia.

Innes Equipment, Ltd., 930 Millwood Rd., Toronto, Ontario, will act as distributor in the Province of Quebec and part of the Province of Ontario.

Galion Allsteel Distributors

Complete parts and repair service as well as new equipment sales of Galion Allsteel hydraulic hoists and dump bodies is being offered by a new Galion distributor, Power Brake Service, Inc., Cleveland, Ohio.

The dealer organization, located at 1307 Carnegie Ave., is headed by Harvey Schach, who will direct sales. John Kucinic is truck equipment manager for the dealer.

Another company, Schweigers, Inc., Watertown, S. Dak., will serve as distributors of Galion products for that state.

Buck Announces New Dealers

Four new dealers for Buck automatically-portable heavy-duty hoisting machines and self-dumping concrete buckets have been appointed by Buck Equipment Corp., Cincinnati, Ohio.

The new distributors are: Akron Waco Scaffolding, 308 Metropolitan Bldg., Akron 8, Ohio; Allied Equip-

Dempster-Diggster bucket GETS A FULL LOAD WITH EVERY STROKE!

The hydraulic crowd and hoist operation of the new Dempster-Diggster GRD-101 gives you big shovel advantages in front end loading and excavation work. As shown in the at-work photos at right, here's what happens: Dempster-Diggster moves into material with shovel lowered against front of frame. No wheel traction is used to get excavation power. The hydraulic crowd and hoist moves bucket out and up following contour of material—getting a full bucket with every stroke . . . reducing loading time and idle truck time, thus getting the job done faster!

When you put your Dempster-Diggster into operation, one of the first things you will find is that your entire operation must be geared to a faster pace. This means greater efficiency of equipment and manpower—more profit to you!

Write us asking for Folder No. 3116 giving you complete information on the features of the Dempster-Diggster, including TRUCK-SPEED MOBILITY TO AND FROM JOBS . . . AUTOMATIC BUCKET TRIP . . . MAXIMUM DUMPING AND DIGGING HEIGHT . . . MINIMUM TURNING RADIUS . . . THE SHOVEL WITH TORQUE CONVERTER . . . HYDRAULIC STEERING, etc. Manufactured by Dempster Brothers, Inc.

In photo below camera catches Dempster-Diggster ready to back off and move up to a truck for loading.



DEMPSTER BROTHERS, 464 Shea Bldg., Knoxville 17, Tennessee





Rolatape
CALIBRATED
Measuring
WHEELS

Measures and records total as it rolls. One man with Rolatape DISTOMETER can measure horizontal, vertical, overhead, curved surfaces—line to line and wall to wall—easily and accurately.

Write for full details
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CONTRACTORS AND ENGINEERS

ment, Inc., 825 N. W. 72nd St., Little River Station, P. O. Box 635, Miami 38, Fla.; H. S. Finke, 1405 S. Broad St., New Orleans, La.; and Fuchs-Clayton Machinery Co., 901 South St., Omaha, Nebr.

Dealer for Concrete Sawing

The Baltimore, Md., firm of Seals, Inc., has been named as a distributor by Concrete Sawing Equipment, Inc., Arcadia, Calif., manufacturer of Concut concrete saws and Foot-hill blades. The dealer, with offices at 4040 Alameda St., will handle the company's complete line of saws and blades in the State of Maryland.

Cascade for Allis-Chalmers

A recently appointed distributor for Allis-Chalmers Mfg. Co., Mil-

waukee, Wis., is the Cascade Farm Machinery Co., 709 McClaine, Silver-ton, Oreg. The new dealer will handle A-C pumps and Texrope drive equipment in the eastern half of Marion County and the southern half of Clackamas County in Oregon.

New Bucyrus-Erie Distributor

Sales and servicing of Bucyrus-Erie excavators and cranes are now being handled by Beasley-Holmes Co., Toledo, Ohio. The new dealer, serving a 14-county territory in northwestern Ohio, handles the full line of Bucyrus-Erie $\frac{3}{8}$ to 4-yard cranes, the truck mounted Hydro-crane and Hydrohoe, and Red Arch dragline buckets.

The firm, operated by Fred G. Beasley and Arthur J. Holmes, is located at 2623 Dorr St., Toledo.

New Dealer for Euclid

The Pecaut Equipment Co., 900 E. 8th St., Sioux Falls, S. Dak., has been named a distributor by the Euclid Division of General Motors Corp., Cleveland, Ohio. Pecaut will provide complete sales and service facilities for the entire state of South Dakota.

Cleaver-Brooks Dealers

The Rupp Equipment Co., Buffalo and Rochester, N. Y., has been named sales representative for road machinery equipment manufactured by Cleaver-Brooks Co., Milwaukee, Wis. Offices of the dealer are located at 101 Great Arrow Ave., Buffalo, and 1011 Buffalo Road in Rochester.

The organization will handle sales

of Cleaver-Brooks products in the western section of New York State.

General Equipment, Inc., 4025 Government St., Baton Rouge, La., will handle Cleaver-Brooks equipment in the entire state of Louisiana. Leary & Owens Machinery Co., 3600 N. Fifth St., Birmingham, Ala., will handle equipment sales in the ten northwestern counties in Florida. The dealer has a branch office located at 3615 Mobile Road, Montgomery, Ala.

Cleco Division Names Dealer

The newest distributor for the Cleco Pneumatic Tool Division of Reed Roller Bit Co., Houston, Texas, is Lichtenberger Bros., 2715 W. Lake St., Chicago, Ill. Cleco manufactures the Cleco and Dallett lines of air-powered tools and accessories.

Sure Protection
AGAINST
CAVE-INS



SIMPLEX Drop Forged Steel TRENCH BRACES

For sure protection against cave-ins, injuries and costly re-digging, specify Simplex Trench Braces. Constructed entirely of steel drop forgings, with ball and socket joints, at each end to ensure quick adjustment and tight grip at all angles. Adaptable to any width trench. Sold with or without pipe in a complete range of sizes.

SEND FOR BULLETIN: U 49



TEMPLETON, KENLY & COMPANY
2511 Gardner Road, Broadview, Ill.

GENERAL MOTORS

leads the way again with the first full line of

AUTOMATIC DRIVE TRUCKS

THIS announcement marks the achievement of a goal towards which General Motors has been working for a quarter-century.

That is the elimination of manual gearshifting in GM-built motor vehicles—trucks as well as cars—a task first undertaken by our research engineers in 1929.

It was no easy assignment. It took more than ten years of hard work, the testing and discarding of hundreds of different mechanisms, before the problem was superbly solved in passenger cars by our Hydra-Matic, Dynaflo and Powerglide automatic transmissions.

In trucks the need for a self-shifting drive is infinitely greater—and so is the engineering problem because of the far heavier loads carried and the larger number of forward-speed gears required to move them.

It was not simply a matter of adapting a passenger car drive. A completely different automatic unit had to be designed and that took still more time.

But by 1950, our GMC Truck & Coach Division had developed and thoroughly road-tested a Dual Range Hydra-Matic-type drive for medium-weight trucks. Then came Korea and our entire production of Truck Hydra-Matic Transmissions was required for army vehicles where its superiority was proved in front-line service.

Within the past eighteen months both four-speed and eight-speed versions of this battle-proved transmission have been successfully introduced to the public in light-duty and middleweight GMC trucks. But there still remained the problem of

heavy-duty trucks, some of which require as many as 15 forward speeds.

Now our engineers—drawing upon this backlog of twenty-five years' experience—have developed a Twin Hydra-Matic Multiple-Speed self-shifting drive for trucks rated above forty-five thousand pounds gross combination weight.

Thus has GM marshalled its inventive skills to bring the many advantages of Hydra-Matic Hauling to every class of truck operator. These benefits include:

Lower fuel cost—because Truck Hydra-Matic automatically keeps the engine in proper gear for every operating condition, eliminating wasteful engine "gunning."

Less maintenance expense—because Truck Hydra-Matic prevents "shock-loading" strains on engine, drive line and rear axle—plus the fact that there is no clutch to repair or replace.

Greater safety—because Truck Hydra-Matic does the shifting, easing the driver's work and permitting him to concentrate on the road ahead.

I think these are good reasons why every user of trucks should investigate the GMC line of Hydra-Matic Trucks—whether you use a small pickup or a fleet of heavy highway haulers.

You are cordially invited to call upon your local GMC dealer to learn more about them.

W. T. Brewster
President

GENERAL MOTORS CORPORATION



Brownskin tarpaulins made by the Angier Corp. are waterproof and rot-resistant.

Reinforced Tarpaulins Protect Equipment

■ Brownskin tarpaulins, manufactured of two laminated layers of creped asphalt-impregnated material and reinforced with Owens-Corning Fiberglas cloth, are offered by the Angier Corp., Framingham,

Mass. Brownskin Tarps are waterproof and rot-resistant. Grommets at 24-inch intervals, they can be used as protective covers for material in outdoor storage, equipment covers, windbreaks, and machinery

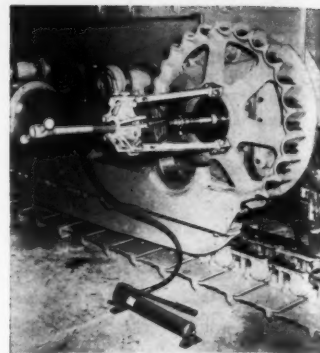
covers. The tarpaulins are available in sizes ranging from 8 x 10 to 15 x 30 feet.

For further information write to the company, or use the Request Card at page 18. Circle No. 649.

Construction Men Elect

James H. Dillon of New York, N. Y., president and executive secretary of the Construction Men's Association, was returned to office at the 11th annual meeting.

All the officers and board members were also reelected. Other officers are Louis R. Hyman, vice president; George D. Harvey, treasurer; and Alfred D. Ronner, recording secretary.



The new Owatonna hydraulic sprocket pullers.

Sprocket Pullers

■ A new hydraulic sprocket puller and installer to fit Allis-Chalmers, International-Harvester, and Caterpillar tractors has been announced by Owatonna Tool Co., 381 Cedar St., Owatonna, Minn. Powered by the OTC 50-ton Power-Twin hydraulic ram, this basic unit with available attachments will remove drive sprockets.

The portable sprocket puller can be operated by one man in the field or in the shop. Three types of pumps are available to activate the ram: a single-speed hand pump, a three-speed hand pump, and an electrically driven pump, all of which operate at 10,000 psi.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 559.

Films on Construction

A 15-minute sound-color film, "New Sewers for Old", has been produced by Armco Drainage & Metal Products, Inc., and is offered without charge for showing to engineering and construction groups. A 16-mm film, it tells how a small industrial community of 35,000 population solved its problem of old and inadequate sewers by a bond issue and sewer rental plan.

The picture treats installation of asbestos-bonded corrugated metal pipe, including the use of steel liner plates in tunnels under railroad tracks.

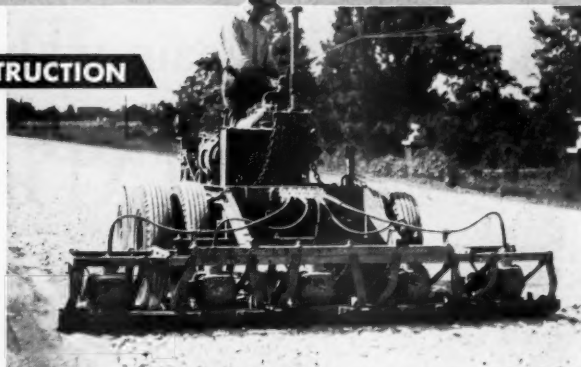
The company is also making available a second film, "Progress on the Labrador Iron Ore Venture", dealing with the construction of 360 miles of railroad, many miles of access roads, landing strips for air-lift supply, two hydroelectric plants, and two town sites with docks in Labrador. This 16-mm film, with sound and in color, runs 25 minutes.

Showings of the films may be arranged by writing the Motion Picture Dept., Armco Drainage & Metal Products, Inc., Middletown, Ohio.

4 WAYS TO BETTER PAVING and BIGGER PROFITS!

MACADAM CONSTRUCTION

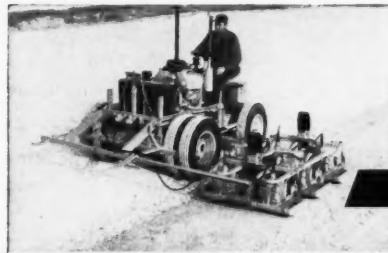
The JACKSON VIBRATORY MULTIPLE COMPACTOR, with a total compaction width of 13' 3", working speeds of 0' to 60' per minute and reverse travel speed of 5 1/2 M.P.H., in one pass will compact 12" of rock to support smooth rollers. In 4 passes compaction to final density may be obtained. With 2 passes all voids from top to bottom can be filled with fines. And in gravel sub-bases 7" thick, one pass suffices to produce densities exceeding



100% Standard Proctor. It's also extremely advantageous in compacting granular soil fills, such as bridge approaches and large factory floors. For the tight places the individual compacting units may be fitted with operating handles and used as self-propelling manually-guided compactors.

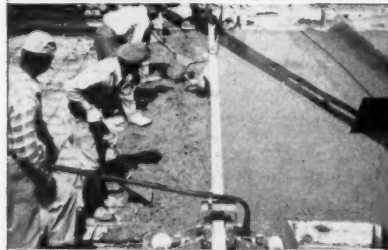
PAVEMENT WIDENING

In any granular material the JACKSON MULTIPLE COMPACTOR will compact the widening strip in just one pass. For this purpose compacting units are assembled in tandem and towed at side of tractor. Assembly adjusts to accommodate varying dimensions of widening strips.



MUNICIPAL PAVING, BRIDGE DECKS

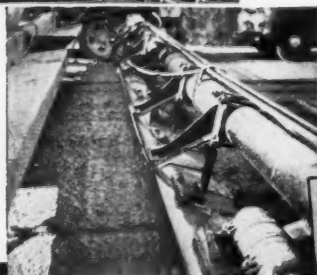
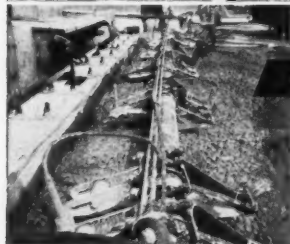
Walks, Drives, etc.: The JACKSON VIBRATORY SCREED strikes off to all crowns, undercuts at curbs and side forms, works right up to and around obstructions and is quickly and easily rolled back for second passes. Suitable to all slabs up to 30' wide. Most productive and convenient screed made. Operates from JACKSON Portable Power Plant.



CONCRETE AIRPORT AND HIGHWAY PAVING

The current, super-powered JACKSON Internal PAVING TUBE will thoroughly vibrate all concrete slabs as thick as 24" and as wide as 25', quickly plasticizing the very dry, harsh mixes. Attached to a standard finisher, its use materially reduces spreading labor where no spreader is used. Adapted to Surface vibratory operation, it will do a perfect job of vibrating any mix in depths up to 12"

Powered by JACKSON Portable Power Plant on parent equipment and controlled by its operator. The one machine that meets ALL specifications.



See YOUR JACKSON DISTRIBUTOR OR
WRITE US FOR COMPLETE DETAILS

JACKSON VIBRATORS, INC.

LUDINGTON,
MICHIGAN

Handi-Horse

Adjustable — Varied Sizes —
Folds Flat

Rubber Feet for Firm Footing

Use for:
Conveyor Stands
Scaffolding
Tables and Benches



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BROADWAY MANUFACTURING CO.
WAUKESHA WISCONSIN

Rubber-Tire Loader Has Four-Wheel Drive And Torque Converter

■ A new four-wheel-drive rubber-tire loader with a one-cubic-yard bucket is announced by Tractomotive Corp., Deerfield, Ill. The Model TL-12 Tracto-Loader is equipped with rear-wheel power steering, a clutch-type transmission with four speeds in each direction, and a torque-converter drive with a three-to-one torque multiplication ratio. The unit weighs about six tons.

The four-wheel drive and torque converter permit operation over rough terrain and in muddy conditions. The torque converter gives the loader a steady flow of power to all four wheels and eliminates clutching during the loading operation. Tire life is increased since wheel spinning is practically eliminated. The converter also allows the operator to maneuver better in close quarters because the machine can be slowed down to a creeping speed without slipping the clutch. The clutch-type transmission allows the operator to change from forward to reverse by pulling one lever. Gear shifting is unnecessary.

The TL-12 has a ground clearance of 15 inches, and an over-all width of 86 inches. The maximum clearance under the cutting edge of the bucket, when it is dumped, is 8 feet. However, the machine will dump into a truck with sideboards 9 feet 8 inches high if the bucket is retracted before backing away from the truck. The machine has double-acting dump and lift cylinders.

An electric starter, electric fuel pump, lights, horn, oil-bath air cleaner, pre-cleaner, oil filter, muffler, drawbar, hydraulic brakes, and parking brakes, as well as the torque converter are standard equipment on this model.

For further information write to the company, or use the Request Card at page 18. Circle No. 528.

Booklet on Silent Chain

■ A new booklet on silent chain drives has been issued by the Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill. The brochure contains detailed engineering data on silent chain and discusses its uses.

The chain is suitable for a broad range of applications—from the tiny fractional horsepower drives in small power tools to huge drives transmitting thousands of horsepower. Silent chain is constructed of leaf links with inverted teeth.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 521.

The Model TL-12 Tracto-Loader, recently introduced by the Tractomotive Corp., features a torque-converter transmission and four-wheel drive.



Use of Torque Converters In Construction Machinery

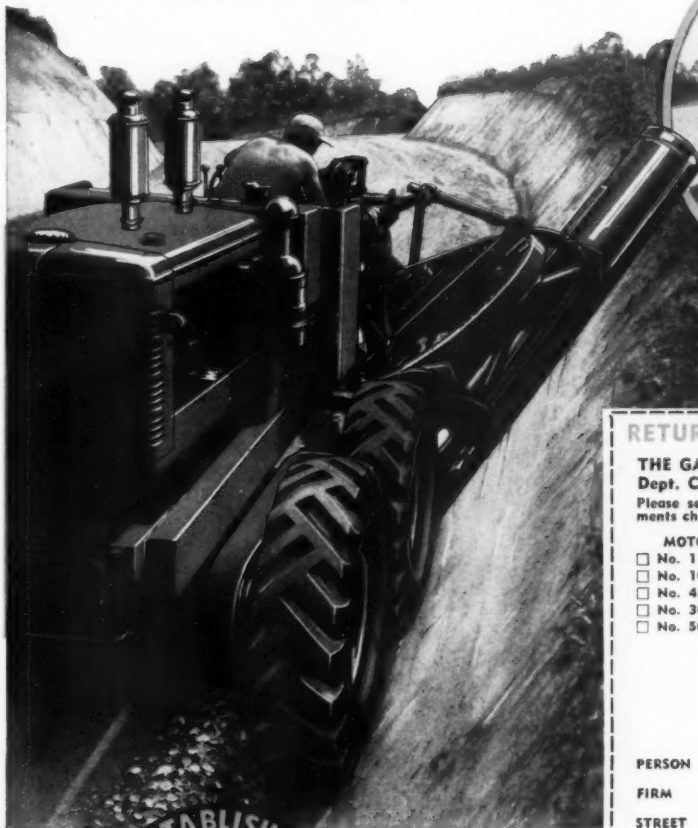
■ The story of man's progress toward superior machines to better his way of life is portrayed in the new issue of *Production Road* magazine, just released by Twin Disc Clutch Co., Racine, Wis.

Other features in this issue include articles on the trend toward modern portable aggregate plants; the adaptability of torque converters to any size drilling rigs; and the solution of power-linkage problems through fluid drives. The hydraulic torque converter as used on heavy-duty trucks is also described and illustrated.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 608.

The tougher the Bank-Sloping job...the more impressive is GALION performance.

The operator of a GALION Motor Grader can obtain all blade positions quickly and easily — by hydraulic control from the platform. GALION'S hydraulic shiftable moldboard eliminates many time-consuming adjustments ordinarily necessary... heel of blade can easily be positioned inside or outside of tandem tires... shifts around obstacles without loss of motion... cuts clean and accurate. Write for catalog today.



Ask your Galion Dealer to show you the color movie, "GALION MAKES THE GRADE".

RETURN THIS COUPON TODAY

THE GALION IRON WORKS & MFG. CO.
Dept. CE-64, Galion, Ohio, U.S.A.

Please send me literature on the machines and attachments checked.

MOTOR GRADERS

- ☐ No. 118, 115-125 h.p.
- ☐ No. 104, 93 h.p.
- ☐ No. 450, 75 h.p.
- ☐ No. 303, 55 h.p.
- ☐ No. 503, 50 h.p.

ROLLERS

- ☐ Tandem
- ☐ Three-Wheel
- ☐ Portable
- ☐ Trench
- ☐ Towing Attachment

GRADER ATTACHMENTS

- ☐ Snow Plows and Wings
- ☐ Hydraulic Shiftable Moldboard
- ☐ Creeper Transmission
- ☐ Bulldozer
- ☐ Elevating Loader

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2 BEST THIN PER SET

FINEST QUALITY
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10 DAY DELIVERY

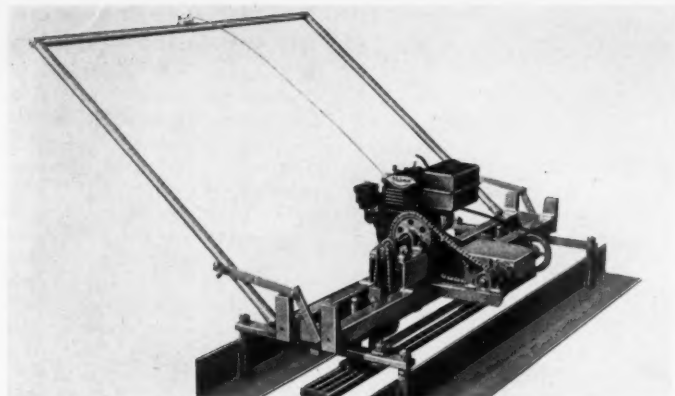
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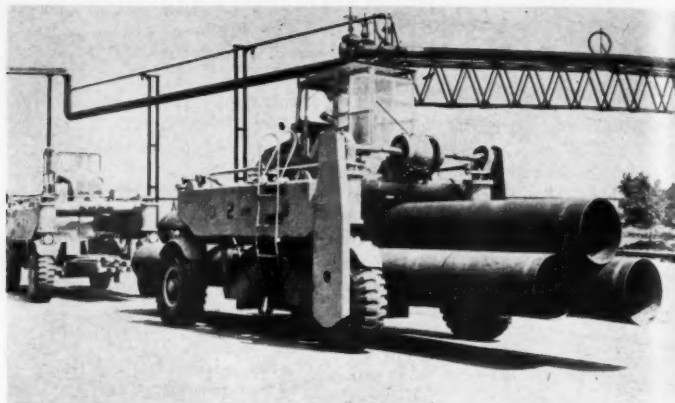


THE GALION IRON WORKS & MFG. CO., General and Export Offices, Galion, Ohio, U.S.A.

Cable address: GALIONIRON, Galion, Ohio



Sidewalk Machine—This new Whiteman combination sidewalk tamping and screeding machine has a frame length of 5 feet, and may be equipped with screeds and tampers for 4, 5, and 6-foot sidewalk widths. The machine makes 90 screed strokes and 225 tamper strokes per minute. For details circle 614 on card at page 18, or write to the Whiteman Mfg. Co., 3249 Casitas Ave., Los Angeles 39, Calif.



Straddle Carrier—Over-the-road transporting of long pipe is one of the uses of the Ross straddle-type carriers. Various models carry from 10,000 to 45,000 pounds and reach road speeds up to 40 mph. The machine travels forward and reverse. For details circle 615 on card at page 18, or write to the Clark Equipment Co., Miller and Second Sts., Benton Harbor, Mich.

Catalytic Device Traps Noxious Exhaust Fumes

■ A catalytic muffler that reduces the noxious and irritating components of four-cycle diesel-engine exhausts has been developed by Oxy-Catalyst, Inc., Wayne, Pa. The new device, called the Dieseler, attaches directly to the engine exhaust manifold and burns by catalytic action the carbon monoxide and hydrocarbon fumes in exhaust gases.

This eliminates much of the heavy smoke and strong odor of the engines and permits more widespread use of four-cycle diesel equipment in construction and material-handling equipment.

This manufacturer has previously introduced a catalytic muffler for engines running on unleaded gasoline.

For further information write to the company, or use the Request Card at page 18. Circle No. 514.

Booklet on Liner Plates For Tunnel Construction

■ A new manual offered by Armc Drains & Metal Products, Inc., 703 Curtis St., Middletown, Ohio, covers liner plates used for original tunneling operations or for relining existing masonry openings. The plates are installed in conduits, service tunnels, underpasses, mine entry slopes and shafts, caissons, aggregate-conveyor tunnels, and storage bins.

The booklet contains data on joint tests, compression tests, strength and weight properties, gages, plate arrangement, and other work. Photographs of many typical operations are included.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 578.

Pennsylvania Road Work Reaches New High in 1954

Pennsylvania's record-breaking road construction work, continuing into 1954, has resulted in a new first-quarter peak in road building. The value of construction, reconstruction, resurfacing, and widening done by the Pennsylvania Department of Highways amounted to \$18,483,000 in the first quarter of this year, \$374,000 more than last year's first-quarter expenditure.

Great new power to speed construction jobs



New 2-tonners with all-new "Jobmaster 261" engine* make light work of heavy hauling . . . save you time every trip

Here's Chevrolet's newest and most powerful answer to your construction hauling needs. New 2-ton Chevrolet trucks have what it takes to speed up your schedules and bring down your costs on big load off-the-road operations.

NEW POWER FOR TOUGH JOBS

You can call on extra reserves of high compression power that takes steep grades and rough terrain in its stride. In fact, the all-new "Jobmaster 261" engine* is the most powerful Chevrolet truck engine ever built. And it delivers increased operating economy besides!

That's because it reduces the need for shifting into the low gears on grades and in traffic.

NEW SPACE FOR BIG LOADS

Spacious new Chevrolet stake and platform bodies permit you to haul wider, longer loads. New Chevrolet pickups also bring you increased load space. These bodies are built to take it—and keep coming back for more!

Why not stop in and get the whole money-saving Chevrolet truck story at your Chevrolet dealer's soon! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET ADVANCE-DESIGN TRUCKS



Prestressing Device—The Simplex Re-Mo-Trol for prestressing concrete is basically a pump connected by a hose to a remote-controlled center-hole hydraulic puller or ram. The device is available in seven models having capacities from 10 to 100 tons. Four of these are made with center hole. For details circle 613 on card at page 18, or write Templeton, Kenly & Co., 2507 Gardner Road, Broadview, Ill.



Compact Mixer—The rear-mounted mixer engine, with the transmission on the side of the flush water tank, gives the Model M Hi-Boy the proper distribution on a short-wheelbase truck. Capacities offered are $5\frac{1}{2}$ and $6\frac{1}{2}$ -cubic yards. The truck shown here is a Mack Model A-40. For details circle 610 on card at page 18, or write to the Blaw-Knox Co., P. O. Box 1198, Pittsburgh, Pa.

NEW CHEVROLET TRUCKS



New, stronger rear axle

Larger axle shafts in 2-ton models provide increased durability that pays off on construction jobs.



New Comfortmaster cab

New one-piece curved windshield increases visibility. New instrument panel is easier to read and reach.



MOST TRUSTWORTHY TRUCKS ON ANY JOB!

Plus all these Advance-Design truck features: THREE GREAT ENGINES—The new "Jobmaster 261" engine* for extra-heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. **SYNCHRO-MESH TRANSMISSION—DIAPHRAGM SPRING CLUTCH—HYPOID REAR AXLE—TWIN-ACTION REAR WHEEL BRAKES** on heavy-duty models. **DUAL-SHOE PARKING BRAKE** on heavy-duty models. **NEW RIDE CONTROL SEAT**—NEW, ROOMIER PICKUP, STAKE AND PLATFORM BODIES—NEW COMFORTMASTER CAB—PANORAMIC WINDSHIELD—BALL GEAR STEERING—NEW ADVANCE-DESIGN STYLING.

*Optional at extra cost. Ride Control Seat is available in standard cabs only, "Jobmaster 261" engine on 2-ton models.

Core-Type Hammer Bits Are Carbide Tipped

■ A new line of carbide-tipped hammer core bits is announced by the Tilden Tool Mfg. Co., 209 Los Molinos, San Clemente, Calif. The bits are made with a core slot and have extension shanks for any depth hole.

While they are designed for use in self-rotating electric hammers, they are reported to operate successfully in standard hammers using turning chucks. The multiple carbides set in the perimeter of the hammer body give rapid penetration of extremely hard materials.

For further information write to the company, or use the Request Card at page 18. Circle No. 555.

Handbook on How to Lay Concrete Pressure Pipe

■ A manual of concrete pipe-laying instructions is offered by Price Bros. Co., 1932 E. Monument Ave., Dayton 1, Ohio. The booklet boils down technical data for practical application. Each page treats a separate step in pipe installation, with a large on-the-job photo and an explanation of the procedure.

The manual contains data on pipes of various sizes and tells how to dig the trench and how to handle joint and bed the pipe. A check list of equipment and supplies needed for the job is also furnished.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 541.

Army Engineers to Merge Two Divisions Next Year

With the virtual completion of the Air Force Base at Thule, Greenland, and other North Atlantic defense installations, the U. S. Army Corps of Engineers East Ocean Division will be terminated effective January, 1955. The remaining work of the division, most of which will be done by next year, will be consolidated with that of the North Atlantic Division, New York, N. Y.

The move will close the division's main office at Richmond, Va., and its Atlantic and Northeast District offices will then be merged into a single district under the North Atlantic Division.



Bituminous Distributors—This 800-gallon distributor is one of 170 Cartwright units being built for the U. S. Army Corps of Engineers. The machines, which feature 24-foot full-circulating spraybars that cut off cleanly, have been delivered at the rate of eight to ten per week. For details circle 612 on card at page 18, or write to Cartwright Industries, 724 N. 40th St., Birmingham, Ala.



Concrete Joint Cutter—First big test for the Felker contraction joint cutter was on the Torrey Pines state highway near San Diego, Calif. Rather than install contraction joints while paving, the contractor laid continuous concrete lanes and cut the joints later with this machine. For details circle 609 on card at page 18, or write to the Felker Mfg. Co., 1125 Border Ave., Torrance, Calif.

Engine-Hour Meter

■ A new instrument manufactured by the Engler Instrument Co., 250 Culver Ave., Jersey City, N. J., provides an accurate operating record for portable and stationary engines. The Engler Hour Log operates on direct current.

Because the device tells how long each piece of equipment has been operating, it eliminates haphazard servicing. The meter can be used on tractors, trucks, road graders, and material-handling equipment to tell the operator when to inspect for overhaul, lubrication, oil change, and maintenance. It is tamperproof and completely sealed.

For further information write to the company, or use the Request Card at page 18. Circle No. 560.

Lubrication Procedures

■ Answers to lubrication problems are contained in literature recently released by Alemite, a division of the Stewart-Warner Corp., 1826 Diversey Pkwy., Chicago 14, Ill. While the booklet shows the right and wrong way to handle lubricants in industrial plants, the information is on fundamentals and has construction applications.

Procedures discussed range from lubrication of the simplest hand guns and loader pumps, through bucket pumps, portable power guns and their transfer pumps, to power-operated barrel pumps. A complete lubrication department on wheels is also treated in the booklet.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 594.

Olin and Mathieson Plan Merger Late This Month

A proposal to merge Mathieson Chemical Corp., Baltimore, Md., and Olin Industries, Inc., East Alton, Ill., will be placed before the stockholders of both corporations June 29.

Olin is a manufacturer of power-actuated tools and fasteners, and Mathieson is a leading producer of chemicals. When the merger becomes effective, preferred stock in both companies will be one share of Olin Mathieson \$4.25 convertible preferred stock. Olin common will be one share of Olin Mathieson common stock.



7 important Dumptor advantages

Take another look at the latest model Koehring 6-yard Dumptor shown here. It has some important features worth checking. Notice how heavy snubber-spring on steering axle cushions road shocks — yet retains Dumptor's unique advantage of no spring maintenance. There are no leaf springs. Big shock-absorbing drive tires eliminate need for springs on the drive axle.

Alignment of drive wheels with steering wheels adds to efficiency of Dumptor no-turn shuttle hauling — makes a big difference in traction and flotation when Dumptor is shuttling back and forth across loose stockpiles, soft ground.

Another basic Dumptor advantage is instant gravity dump. It's controlled by a simple body latch and new dump lever

arrangement. Gravity dumping eliminates slow-acting, troublesome body hoists — never balks, never wears out. Notice, too, the new streamlined, all-steel body. Even with all this heavy-duty strength, Dumptor still has more than 6 h.p. for every ton of loaded weight. It accelerates fast, pulls through soft ground and up grades with less shifting — climbs 24% grades fully loaded.

Let your Koehring Distributor give you all the latest Dumptor® facts. See him soon, or write.

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Subsidiaries: PARSONS
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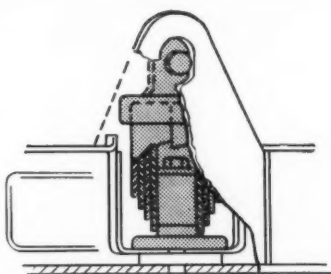
CONTRACTORS AND ENGINEERS



Patching Machine—The chief feature of the O'Hadi patcher is that it heats both the hole and the mix at the same time. Contained radiant heat and not a direct flame does this job. The machine is recommended for year-round patching work being designed for use in any kind of weather. For details circle 616 on card at page 18, or write to the Buhl Machine Works, Buhl, Idaho

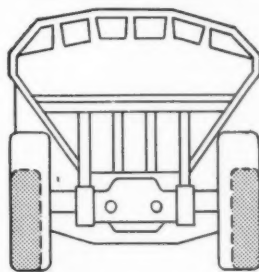


Breaker and Tamper—The dual-purpose Mighty Midget Model MMB is a pavement breaker and backfill tamper in one unit. The machine breaks concrete up to 9 inches thick and has an automatic impact regulator valve that allows it to power-tamp backfill over fragile installations. For details circle 611 on card at page 18, or write to the R.P.B. Corp., 2751 E. 11th St., Los Angeles 23, Calif.



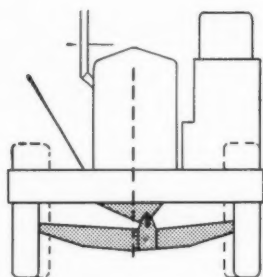
Smooth ride

Heavy, snubber-type spring is mounted between Dumptor main frame and the steering axle. Shock-absorbing action provides plenty of "cushion" — takes all the jolts out of rough, off-road travel. Easy on operator and machine.



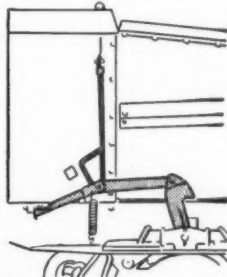
Tires track in direct line

Wider, heavier steering axle puts Dumptor steering wheels in direct line with big drive wheels. Tires track in the same path. There's less rolling resistance, better traction in soft ground, and on rough haul roads.



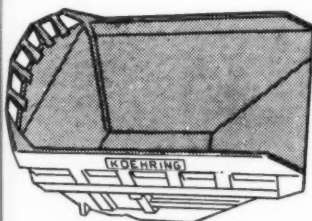
Off-set pivot on axle

Pivot point on steering axle is off-set from center line $3\frac{1}{4}$ " toward operator side of machine. There's no sag, even with unbalanced load. Steering axle oscillates up to 21" — keeps twisting strains out of Dumptor main frame.



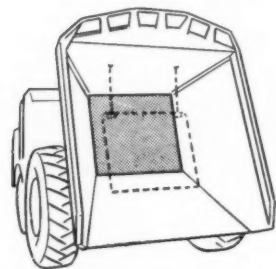
New body-latch, dump lever

Body latch for 1-second gravity dumping is simple, trouble-free. Latch is engaged by a single hook, mounted on the chassis frame. Dump lever is located inside the cab, in an easy-reach position to left of operator.



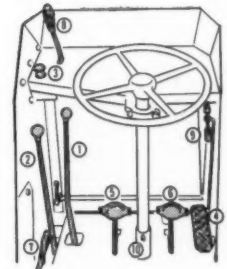
Streamlined, all-steel body

Inside is free of bulges or ledges. Top edge is box-beam constructed. Sides, ends are ribbed with 5 and 8" channels. Double-plate bottom is lined with multiple steel beams. Note ridge bar added to sturdy rock-guard teeth.



Bolted or free-swinging pan

Heavy steel kick-out pan is $\frac{1}{2}$ " thick. Pan can be bolted to body floor for extra protection when loading rock. Remove bolts, and pan has free swinging kick-out action — breaks suction when dumping wet or sticky materials.



Easy-reach controls:

(1) Speed gear shift lever, (2) directional gear shift lever, (3) starting aid, (4) foot throttle, (5) clutch pedal, (6) brake pedal, (7) parking brake, (8) body-release lever, (9) hand throttle, (10) running lights control switch.

Sealed Limit Switch

■ A new, completely sealed limit switch, designed for use on equipment where dust, dirt, abrasives, or liquids may be present, has been developed by Micro Switch, Freeport, Ill. The switch's entire housing, including the operating head with its actuator and return mechanism, is sealed.

The switch may be mounted in almost any position in relation to the means of actuation. The operating head is adjustable to any of four horizontal positions and the roller may be reversed on the arm.

The switch is listed by Underwriters' Laboratories for 20 amperes 110, 220, or 440 volts ac; $\frac{1}{2}$ ampere 115 volts dc; $\frac{1}{4}$ ampere 230 volts dc; $\frac{3}{4}$ hp, 110 volts ac; and $1\frac{1}{2}$ hp, 220 volts ac.

For further information write to the company, or use the Request Card at page 18. Circle No. 599.

Literature on Pantograph

■ A precision pantograph is shown in literature from Geo-Optic Co., Inc., 170 Broadway, New York 38, N. Y. The Ott Type 500 pantograph reproduces drawings and designs to an increased, reduced, or equal scale. With four bars, each 19.7 inches long, the device has a wide tracing range at various ratios. The accuracy of reproduction is plus or minus 0.15 mm.

The literature shows the pantograph in operation and illustrates such features as a tracing, magnifier and a special drawing device. The latter, available optionally, handles the tracing or dotting pin with a cable release.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 643.

Porter Names Thompson

Succeeding R. F. Allen as assistant to the executive vice president of H. K. Porter Co., Inc., New York, N. Y., is W. Harvey Thompson. Mr. Allen has been elected a vice president in charge of the company's Buffalo steel division.

Before he joined the Porter organization, Mr. Thompson was vice president of Standard Instrument Corp., New York, N. Y.

Booklet on Attachments For Wheel-Type Tractor

■ A new booklet illustrates many of the jobs that can be handled by the Ford tractor. Also featured is a complete line of Dearborn tractor-mounted equipment, including loaders, angle-blade dozers, blades,

cranes, snowplows, disks, mowers, and moldboard plows. Specialized tools are also shown.

To obtain this literature write to the Tractor and Implement Div., Ford Motor Co., 2500 E. Maple Road, Birmingham, Mich., or use the Request Card at page 18. Circle No. 518.



HOW DEEP IS THE OCEAN...

The SUBSCOUT® Portable Depth Indicator can tell you!

Write for FREE BROCHURE on this NEW,
SELF-ACTIVATED, ACCURATE and GUARANTEED
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Faubert Construction Co.
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Asphalt Materials and Construction, Inc.
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Plant Mix, 3—Open-Graded Road Mix, 4—
Dense-Graded Plant Mix, 5—Dense-Graded
Road Mix, 6—Mat Coat, 7—Seal Coat, 8—Sand
Mix, 9—Sand Honing, 10—Patching.

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Plants and Processes
LAFAYETTE, INDIANA



Cold mix from stock pile being used for patching.

How To Assure Permanent Pavement Patching—Hot or Cold—In Any Season

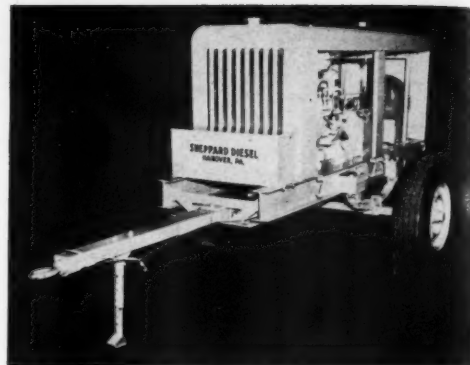


Winter patching with hot mix.



Patching by spray application.

The new Sheppard diesel
generating set can be
towed by a jeep or light
truck.



Diesel Generating Sets Are Trailer-Mounted

■ Trailer-mounted portable gener-
ating sets are offered by the R. H.
Sheppard Co., Inc., 47 Middle St.,
Hanover, Pa. The new packaged

units are self-contained and con-
sist of a Sheppard full-diesel engine
coupled with a 10 or 15-kw gener-
ating set. The generating sets have
sheet-metal housing which provides
for incorporating controls within the
housing. Mounted on rubber-tired
steel trailers, they are highly mobile.

It is reported that many organi-
zations using the new Sheppard units
are tying them directly into their
present main power sources as
stand-by protection against power
failure. In such installations, auto-
matic controls activate the generating
set the instant power fails, thus pro-
viding a dependable source of imme-
diate power. Because of the close
regulation possible with the Shep-
pard diesel, the new units are
recommended for applications where
close modulation and frequency reg-
ulations are factors of importance.

For further information write to
the company, or use the Request
Card at page 18. Circle No. 657.

Dual-Use Form Board

■ A publication describing the new
Fiberglas acoustical form board for
poured-in-place roof decks for in-
dustrial plants, commercial buildings,
and schools is available from the
Owens-Corning Fiberglas Corp.,
Toledo 1, Ohio.

Two types of incombustible form
boards are offered. One has a bonded
Fiberglas mat facing to provide a
uniform and more attractive appear-
ance as an interior ceiling. The
other is sanded on one side for use
when a smooth ceiling surface is
desired.

The form board performs four
basic tasks, according to the publica-
tion. It supplies a permanent form
for the deck, provides thermal insu-
lation, and serves as both an acous-
tical and an interior ceiling.

To obtain this literature write to
the company, or use the Request
Card at page 18. Circle No. 606.

CITY street departments as well as
county and state highway depart-
ments throughout the country are be-
coming more and more sold on the *extra
value* of McConaughay Weatherproof
Emulsified Asphalt for pavement patch-
ing. Mixtures made with these emulsions
assure superior results in any season...
cold mixtures used immediately or
stock-piled for future use... hot mixtures
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cold weather. You can also depend upon
these emulsions for durability in appli-
cation types of patching.

You can be sure of fast, dependable
service on asphalt emulsions and mixes
by calling any of the McConaughay
Licensees listed at left. This co-ordinated
group, guided by a central organization,
is made up of experienced manufacturers
and contractors who fully understand
your problems, who offer engineering
and testing services on paving materials
and mixtures as well as on-the-job ad-
vice. Take advantage of this exceptional
service; get in touch with your nearest
McConaughay Licensee or contact...



"Ahh—quit houndin' us, will yuh?"

CONTRACTORS AND ENGINEERS



This $\frac{3}{4}$ -cubic-yard Page Automatic RM bucket is digging compacted clay with an overlay of sand and loam.

Line of Medium-Weight Dragline Buckets

■ A new medium-weight bucket, available in capacities of $\frac{3}{8}$ to 3 cubic yards, has been added to the line of dragline buckets made by the Page Engineering Co., Clearing Post Office, Chicago 38, Ill.

Designated the RM class, the automatic buckets will dig sand and loose gravel as well as dirt, clay, or any material free of stumps and boulders. The RM's new knife-edged lip and replaceable teeth are cast of high-manganese steel to withstand shock and abrasion.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 542.

Right-Angle Drill

■ A right-angle drill is built by the Milwaukee Electric Tool Corp., 5314 W. State St., Milwaukee 8, Wis. Available in eight basic models, the Milwaukee Tri-Speed drill can be used to work around corners, pipes, conduits, or other obstructions, between 12-inch-center joists, and in similar close quarters. The tool's drive offers two chuck speeds in addition to the regular spindle speed.

Basically, the unit is a straight electric drill driven by a $\frac{1}{2}$ -hp motor to which the right-angle drive is added. The drill end can be swiveled and locked in any position. On the high side of the right-angle drive, speed is boosted 50 per cent. By reversing the position of the drive to the low side, the drill's normal chuck speed is reduced by 33 per cent.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 525.



The Milwaukee Tri-Speed right-angle drill works in tight spots and around obstructions.

Promotions at Gar Wood

Three district managers and two assistant sales managers have been appointed by Gar Wood Industries, Wayne, Mich., manufacturer of earth-moving and highway-construction equipment.

D. R. Hetrick, formerly assistant sales manager, will cover tractor equipment sales in five states in the midwest, Kentucky, western Pennsylvania, and Ontario, Canada. K. W. Chaffee, previously on the sales promotion staff, will cover 12 states in the east, Washington, D. C., Quebec, Newfoundland, and Nova Scotia. Seven states in the west, British Columbia, Alberta, and Alaska will be handled by M. A. Staben, formerly district manager for the industrial division of Oliver Corp.

The new assistant sales manager

for tractor equipment sales is R. H. Worpell. Serving as assistant sales manager for the company's Findlay Division is A. M. Guthrie.

Nordberg Appointment

George V. Dutney has been named special assistant to the president of

Nordberg Mfg. Co., Milwaukee, Wis., manufacturer of diesel engines. Making his headquarters in the company's New York offices, Mr. Dutney will represent the president in sales and special public relations.

For the past 12 years, Mr. Dutney has been on the Johns-Manville headquarters staff in New York.

now...you can RENT

The Neo-Flasher BARRICADE

FOR NO MORE THAN THE OPERATING COST OF ONE KEROSENE TORCH

NO MESSY KEROSENE • NO BARRICADES TO BUILD • NO STORAGE PROBLEMS • NO WEEKEND PREMIUM LABOR • NO CAPITAL INVESTMENT

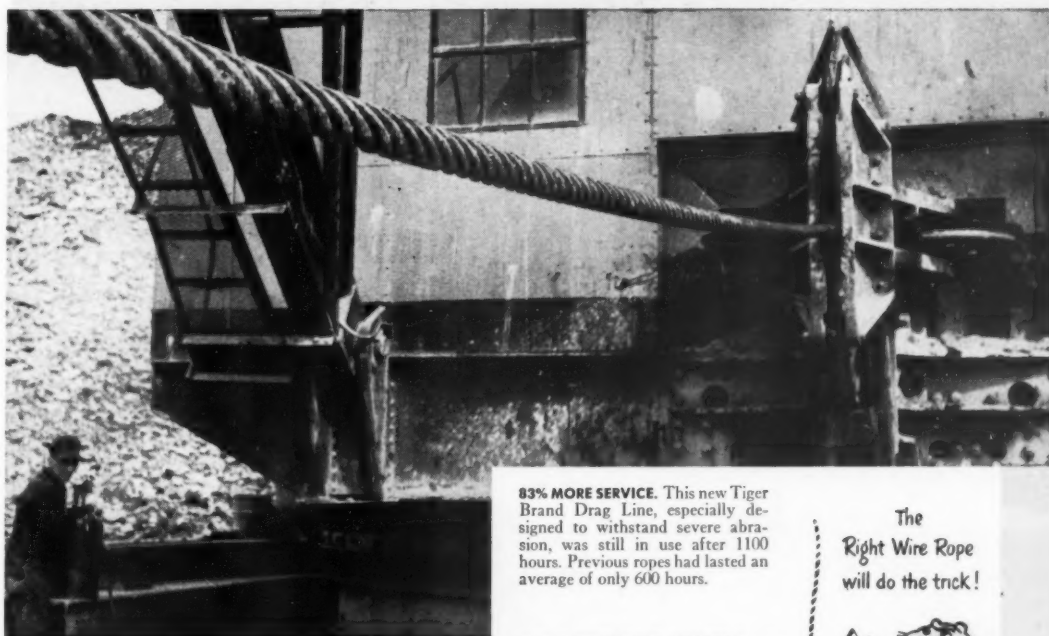
Neo-Flasher Steel Barricade Model A. Equipped with reflectorized steel panel, Neo-Flasher Model 1-100-LSR, tamper proof switch and locking device. Your name plate at slight extra charge.

DEALER INQUIRIES INVITED

LIGHT PRODUCTS, INC. Dept. CE-2
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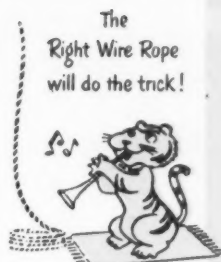


Look at these amazing Tiger Brand records!



83% MORE SERVICE. This new Tiger Brand Drag Line, especially designed to withstand severe abrasion, was still in use after 1100 hours. Previous ropes had lasted an average of only 600 hours.

2 TO 3 TIMES MORE SUPPORT from these Tiger Brand Boom Supports. Interwoven ends distribute vibration over a long section of the rope instead of letting it concentrate at one point. As a result, these ropes last longer and cut boom support costs as much as 50%.



• Tiger Brand Wire Ropes are designed for the particular type of job on which they are intended to work. They have the needed balance of strength, toughness, flexibility and wear resistance. The quality is carefully controlled, from the iron mines to the finished product, and by our own engineers. Rigid tests and inspections at every step of the way guarantee a rope that matches the design specifications.

In addition, we maintain a staff of experienced Wire Rope Engineers to advise customers the correct rope to use, so that they get the best rope for every job.

Consult these men the next time you need rope. They can help you get longer service and cut rope costs.



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U-S-S AMERICAN TIGER BRAND WIRE ROPE

Excellay Performed



UNITED STATES STEEL

Kettle and Applicator in One Unit Apply Joint Sealer Under Pressure

■ A new joint sealer combines, in one compact unit, all the equipment necessary for melting sealing compound for application under controlled pressure. The Clipper joint sealer was recently used to fill a 1/8-inch sawed contraction joint three inches deep in one operation. Designed primarily for 1/8-inch-wide sawed joints, the machine uses controlled pressure to give positive penetration regardless of the width or depth of the cut. The rate of flow is controlled by the operator at the point of application to hold material waste to a minimum.

According to the manufacturer,

the machine will seal approximately two miles of sawed contraction joints of any width in a working day, averaging 1,250 feet an hour. Kettle capacity is 165 gallons, and the melting production rate is 40 gph.

The heart of the machine is an oil-jacketed tube-fired double boiler kettle, designed for heating rubber-base asphalt compound. The trailer-type unit, complete with yoke, is mounted on an automotive axle assembly. This permits it to be towed to any job site, and it gives the unit maneuverability along the joints to be sealed.

Multiple horizontal torch-type



The new Clipper joint sealer combines kettle and applicator in one unit which dispenses asphalt under pressure.

burners use bottled propane gas from two 15-inch containers mounted on the rear of the kettle. A factory-set thermostat and gas-pressure-regulating control give automatic

temperature control. The oil-bath heat transfer and a power-driven agitating system work together to eliminate the possibility of hotspots or localized over-heating. An additional layer of insulation increases the heat-retaining qualities of the kettle. Fifty-pound slabs may be melted in the kettle. The kettle does not have to be fully charged to operate efficiently.

The applicator bar is tipped with special-alloy heat-treated steel nozzles in various widths. The melted compound, discharged from either side of the kettle, is forced through a flexible hose to the nozzle. An added feature is an after-heater, used when necessary, to thaw the sealer tip orifice.

Equipment includes an asphalt pump with a pressure-by-pass valve and an agitator. These are powered by a Wisconsin Model AHH air-cooled engine rated at 9.2 horsepower.

For further information write to the Clipper Mfg. Co., 2800 Warwick Blvd., Kansas City, Mo., or use the Request Card at page 18. Circle No. 511.

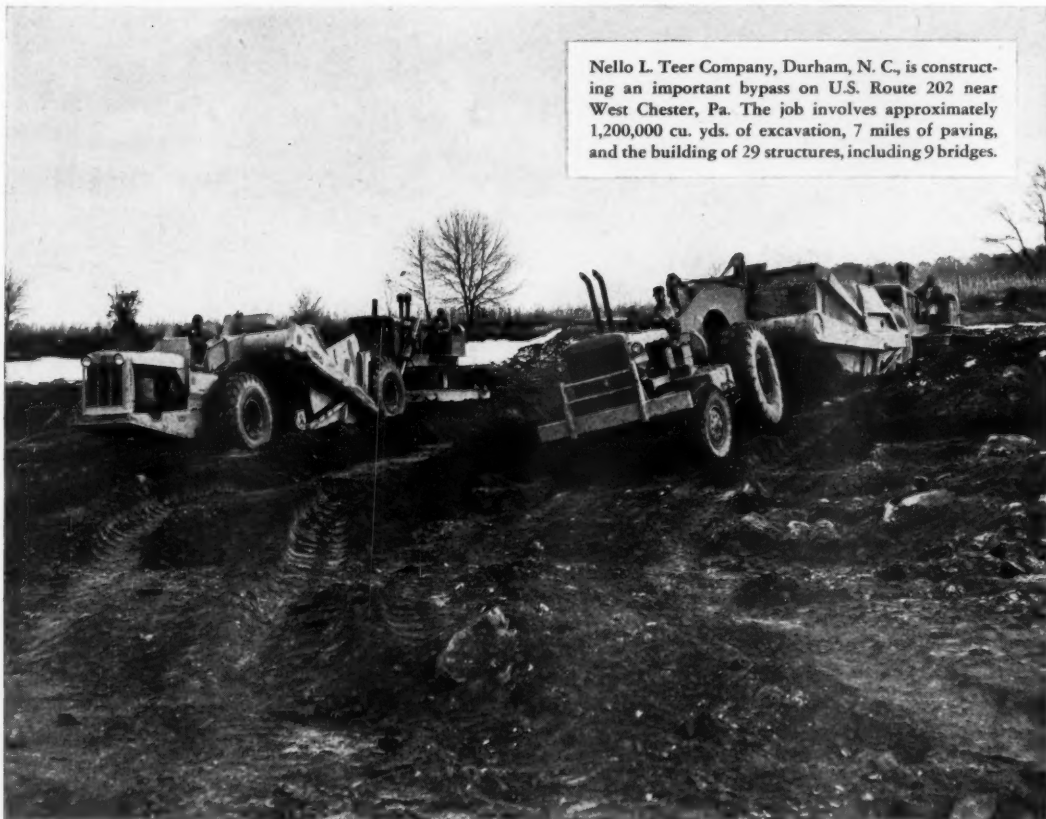
Water Seals Elects New Company Officers

The board of directors of Water Seals, Inc., Chicago, Ill., has elected Frank M. Fucik president of the company. He had been vice president of the firm since its inception. Arthur Hoffman was elected vice president of Water Seals, manufacturer of Labyrinth Waterstops used in the construction field to prevent seepage between successive pours of concrete.

GULF PRODUCTS and FINE SERVICE

keep equipment rolling

on Pennsylvania Highway Project



Nello L. Teer Company, Durham, N. C., is constructing an important bypass on U.S. Route 202 near West Chester, Pa. The job involves approximately 1,200,000 cu. yds. of excavation, 7 miles of paving, and the building of 29 structures, including 9 bridges.

ANOTHER important construction job where equipment is making an outstanding record of dependable performance with the help of Gulf Quality Products and Fine Service.

Here is why Gulf is the preferred supplier of petroleum products to so many leading contractors, like Nello L. Teer Company, for example: Gulf Lubricants provide an extra margin of protection—whether it is hot or cold, wet or dry. And Gulf Fuels help insure full power.

When Gulf Quality Products are combined with expert engineering counsel and prompt delivery service, you have a Gulf package that is bound to smooth the way to greater yardage, better

equipment performance, and lower repair costs.

Gulf Quality Lubricants and Fuels—and that Good Gulf Service—are quickly available to you through more than 1400 warehouses in 31 states from Maine to New Mexico.



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**SALES
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CAPACITY
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FOR:

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CONTRACTORS AND ENGINEERS



The 3.3-hp Lauson Model TLH engine.

New Gasoline Engine

■ A new 3.3-hp gasoline engine is offered by the Lauson Co., New Holstein, Wis. The Lauson Model TLH four-cycle engine features a high-tension magneto, a drop-forge crankshaft with ball bearings on both ends, flexible gas lines, flyball governor, replaceable rod-bearing liners, an oil pump, and streamlined styling. The air-cooled engine is recommended for use with power mowers, pumps, sprayers, generators, snow blowers, cement mixers, line markers, concrete saws, and similar powered equipment.

For further information write to the company, or use the Request Card at page 18. Circle No. 652.

Truck Mixer Bulletin

■ A new booklet covering the Transcrete truck mixer is available from the Construction Machinery Co., 447 Vinton Ave., Waterloo, Iowa. Among features described is the CMC truck mixer's new handwheel which locks the hopper in for charging and out for discharging. Details are also given on the unit's rear-end controls, including clutch, direction-shift, and engine-throttle controls. These controls are grouped at the rear for remote operation from the ground or catwalk.

Other components covered are the measuring tank, standard flush tanks, feed water pump, and the drum brake which automatically engages as the clutch is thrown out and stops the drum instantly with no coasting. The drumhead reinforcement is all on the outside, leaving the inside free of obstructions. A drip ring prevents grout from running down the mixer drum.

The new mixer will be available in 3½, 4½, and 5½-yard sizes with a permissible ½-yard added rating.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 564.



"Keep an eye on that guy there—I like his attitude."

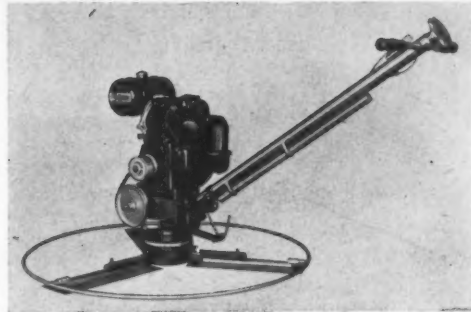
JUNE, 1954

New Concrete Finisher Is Improved Model

■ An improved concrete floating-finishing machine, the new Model B-1, is announced by the Whiteman Mfg. Co., 3249 Casitas Ave., Los Angeles 39, Calif.

Ball thrust bearings have been added at the top and bottom of the handle, making trowel adjustment easier with the machine in motion. A Timken-bearing-equipped gear case gives smoother operation and reduces wear. A safety switch on the handle shuts the finisher off automatically when the operator releases the grip. Trowel adjustment arms

The new Whiteman Model B-1 concrete floating-finishing machine.



are protected from concrete by a rubber collar.

For further information write to

the company, or use the Request Card that is bound in at page 18. Circle No. 653.

Check 'Em!

**ONLY
ADAMS
Motor Graders
have all these
time and
money-saving
advantages**

8 Forward Speeds

✓ Provide the "right" speed for every operation and a higher travel speed. Save time—reduce costs.

4 Reverse Speeds

✓ Up to 13 mph. . . Save valuable production time backing on short stretches, between forms, etc.

3 "Creeper" Speeds

✓ ¼ to 1 ¼ mph. (optional). Use full engine power while gearing grader to slow-speed operation.

Rubber-Mounted Engine

✓ Floating power—no engine vibration transmitted to grader. Increases operator efficiency.

Dual Braking System

✓ Service brake applies hydraulic braking action to transmission as well as wheels. Quicker, safer stops.

Foot Accelerator

✓ Permits operator to drive grader as naturally as truck or automobile. Safer handling in traffic.

New Heavy-Duty Constant-Mesh Transmission

✓ Easy, positive gear shifts at all speeds . . . Heavy construction with helical gears on roller bearings for quietness and long life. The finest ever put into a motor grader.



ASK YOUR ADAMS DEALER FOR AN ON-THE-JOB DEMONSTRATION

*Make your next
motor grader an*





This new Pettibone Wood bottom-dump wagon spreads transversely.

Bottom-Dump Wagon Spreads Transversely

■ A bottom-dump wagon which spreads transversely across the road to any desired thickness of spread is announced by the Pettibone Wood Mfg. Co., Box 620, 6900 Tujunga Ave., North Hollywood, Calif. The advantages claimed for transverse spreading, as opposed to the ordinary longitudinal spreading, are the saving of at least one spreading operation and the more accurate control of materials.

The Pettibone Wood bottom-dump wagon can be towed by an ordinary truck tractor having tandem drive. Hydraulic controls for the bottom-dump wagon are cab-operated. Capacity is 13 cubic yards.

For further information write to the company, or use the Request Card at page 18. Circle No. 534.

Two Power Takeoffs For Heavy-Duty Trucks

■ Two new power takeoffs for GMC heavy-duty trucks with hydraulic transmissions have been placed on the market by St. Paul Hydraulic Hoist, 36253 Michigan Ave., Wayne, Mich. The power takeoffs are for use with any of the company's hoists and truck bodies or with other special truck equipment.

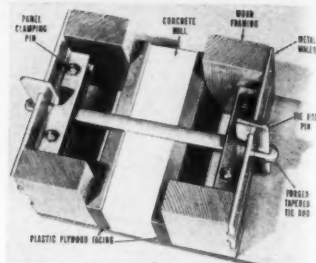
One model is operated only in the forward 1 to 2 low-range speed of the transmission. An interlocking device prevents it from being engaged in any other position. The second model can be operated in both the forward 1 to 2 low range and the reverse speed of the transmission. Either model can be used for hoisting operations with the truck traveling in reverse.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 595.

Manager for Raymond Dies

Harry A. Lutz, 57-year-old project manager for Raymond Concrete Pile Co., New York, N. Y., died of a heart attack in Sydney, Australia, where he was directing construction of a reinforced-concrete pier for Australian Oil Refining, Ltd., Sydney. Mr. Lutz joined the international foundation and heavy-construction firm in 1927 and had been on construction operations on four continents.

Seven years ago the Republic of Liberia conferred on him its highest civilian decoration for directing construction of the Free Port of Monrovia. He had previously supervised harbor and port construction in Colombia, Venezuela, and New Zealand.



THIS CROSS SECTION view illustrates the chief features of the Rocform forming system. Round tapered tie rods space the inner and outer wall panels when the tie-rod pin is interlocked on the wale and the tie-rod slot. This is done in one operation. The manufacturer stresses that this fast forming method is also safe, since the tie rods carry a working load of 11,000 pounds. For further information write to the Rocform Corp., 15160 W. Eight Mile Road, Detroit, Mich., or use the Request Card at page 18. Circle No. 654.

EIMCO

WORLD'S FINEST TRACTOR-EXCAVATOR

OPEN PIT OPERATIONS INCREASE PRODUCTION WITH SMALL INVESTMENT

Eimco 105 tractors with excavating RockerShovel attachments are being used in open pit mining with extraordinary results:

Loading time 6 yd. truck 45-50 sec.

Average payload per truck 10 tons

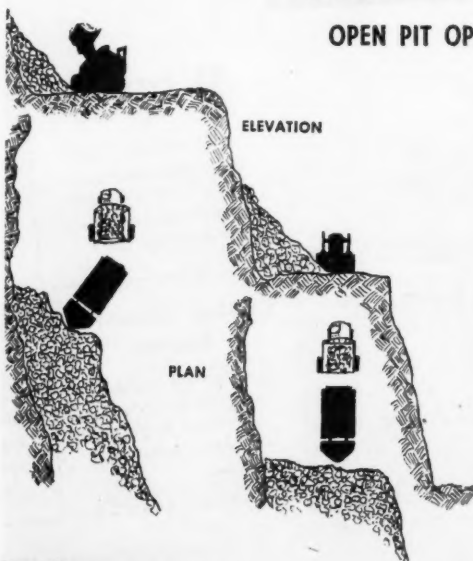
Based on 50 min. hr. and half minute switching time for trucks average hourly production 400 tons

Exceptional loading in many operations has shown even greater tonnage figures where material handled was from stock pile and haulage traffic was not confined to narrow roadways such as encountered in benches of open pit systems.

Eimco 105's are in use by contractors in tunnels and on new construction, rock quarries, underground mining, steel mills and on many other jobs. Where speed and dependability are essential the 105 has proved to be the most rugged piece of equipment ever used.

The exceptional features of the 105 make it the finest piece of equipment of its type ever produced. The Unidrive transmission which contains all clutches and gearing for instant reversal, independent track control and gear changing without stopping are indicative of the new approach to heavy prime moving equipment.

The Eimco 105 final drive is another important design feature. The final drive unit (shown right) is composed of two separate units each of which is driven entirely independently of the other or one may be driven in reverse of the other.

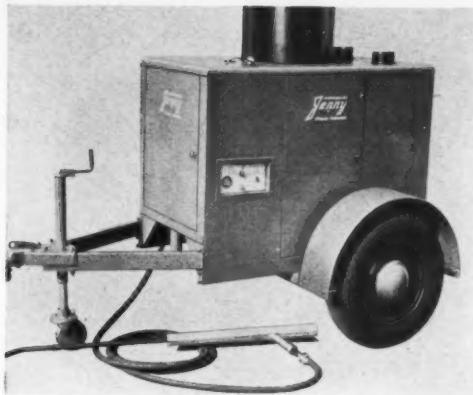


Line of Steam Cleaners

■ A new series of steam cleaners for heavy-duty equipment cleaning is announced by the Homestead Valve Mfg. Co., Coraopolis, Pa. The cleaner features a single heating coil with oil-fired burner, and it has sufficient volume to supply up to four cleaning guns.

Available in trailer-mounted, shop portable, or stationary units, the Series 3000 Hypressure Jenny cleaners may be had with a choice of electric motor or gasoline-engine drive. Automatic electric ignition instantly starts the unit, which delivers a cleaning blast of 300 gallons

The Series 3000 Hypressure Jenny steam cleaner.



per hour within 3 minutes from a cold start. Capacity is 100 gph if the unit is to be used for heat transfer purposes. Fuel and solution tanks of 26-gallon capacity provide ample fuel and concentrated cleaning solution for continuous operation. There are metering controls on both the fuel and solution lines.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 655.

Multipurpose Excavator

■ How the multipurpose Gradall excavating machine performs a wide variety of earth-moving and construction operations is the subject of a new brochure released by the Gradall Division of the Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.

The booklet uses action pictures, schematic diagrams, and cross-sectional and cutaway drawings to illustrate construction features of the machine. The principal components described are the telescoping boom, hydraulic control and power system, rotating platform, turntable, operational controls, and carrier unit.

On-the-job views show the Gradall on 19 different types of excavating and earth-moving work. A description of 16 quick-change boom attachments, a list of specifications, visual charts showing the machine's working and lifting capacities, and a map of the company's nation-wide distributor organization complete the brochure.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 563.

Assistant Engineers Named For N. Y. Public Works

Four new assistant engineers have been appointed to various districts in the New York State Department of Public Works. The new appointees are Austin M. Sarr, Bernard F. Perry, William J. Dennis, and Francis J. Weber.

Mr. Sarr, appointed to the District 2 office at Utica, was formerly senior civil engineer in the construction division in the same district. Appointed to the District 4 office at Rochester was Mr. Perry, formerly associate civil engineer in the Rochester district construction division. Mr. Dennis has been transferred from the main office in Albany to the District 6 office at Hornell. He was formerly associate soils engineer. Mr. Weber, who was acting assistant district engineer in the Binghamton district, is now assistant engineer in District 9 at Binghamton.

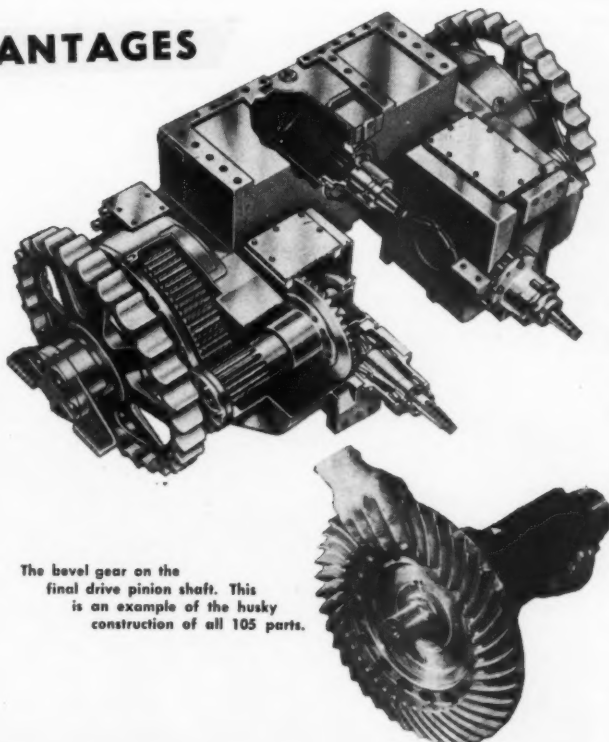
WATH COST SAVING ADVANTAGES

VESTMENT

These final drives are each powered through matched pinion, ring gear sets through heavy, 45-50 steel shafts, husky pinions and gears. Even the 10-ton shafts are heavier in construction and larger in diameter than similar shafts used in any large tractor on the market today. Shafts are in Timken bearings that are separately caged for easy access, perfect alignment and long life. Clutches and brakes in final drive are eliminated. Gear cases are heavy alloy cast steel. Pinions, gears and other parts are specially heat-treated for long service life.

Additional exclusive features include full oscillating tracks even with the excavator attachment. Very simple controls, torque converter drive, full reliability with operator up front, all steel construction, clutches that never need adjustment. These are the unique features that make the 105 the most maneuverable heavy tractor on the market.

We invite you to see, operate and compare the 105 with any other crawler prime mover. Write for information to The Eimco Corporation, P.O. Box 300, Salt Lake City, Utah, or to any Eimco branch.



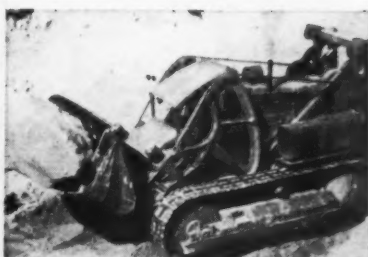
The bevel gear on the final drive pinion shaft. This is an example of the husky construction of all 105 parts.



Works on the pit bench. 105's maneuverability keeps trucks to stay in close.



Huge boulders are pushed over side by 105 with excavator attachment.

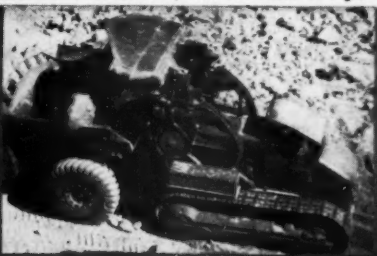


The 105 picks up and loads larger pieces than can be handled by 1½-2 yard conventional shovels.

load and waits for truck to position

A pull on the lever and over it goes. Heavy duty trucks can be loaded fast, with the bucket in high.

Less rugged equipment can be loaded easily with the bucket in low speed.



THE EIMCO CORPORATION

Port Offices: Eimco Bldg., 52 South St., New York City • Salt Lake City, Utah—U.S.A.

Branches: New York, 51-52 South Street • Chicago, 301 So. Hicks Road, Palatine, Ill. • El Paso, Texas • San Francisco, 637 Cedar St., Berkeley, Cal. • Birmingham, Ala., 3140 Fayette Ave. • Duluth, Minn. • Kellogg, Ida.



8-40



"Could you fill the bottom of my pot with gravel?"

Truck and Trailer Asphalt Distributors

■ Bituminous distributors for applying asphalt, tar, emulsion, or road oil are made by the Municipal Supply Co., 2508 S. Main St., South Bend 23, Ind. South Bend distributors for conventional and cab-over-engine truck mounting are offered in capacities of 800 to 2,100 gallons. Units for semitrailer mounting are available in 1,500 to 3,000-gallon ratings. All models in this line are now made in one standard type that includes identical tank structures, operating controls, and unit assemblies.

Spray widths are from 2 to 24 feet to accommodate any road. The full-circulating spraybar has a lateral movement of 8 inches to either side for covering irregular areas. A



The South Bend bituminous distributors feature a full-circulating spraybar, convenient operating controls, and a self-drainage pump.

swing-up section and a 10-inch hydraulic lift allow for highway travel and for clearing obstructions.

In the distribution system, the tank suction feed line runs from a sump at the rear bottom end of the tank and is directed into a four-way lever-operated central control valve. This control system permits discharging through spraybars, pumping material into a distributor tank, circulating material in the tank, pumping from the distributor into any other receptacle, and pumping through a hand spray hose.

Operation of the discharge valve sucks back into the tank the material in the spraybar or hand patching hose. This system does not require a relief valve. Valves in the suction and return line permit draining of the Viking pump and distribution system when material is in the tank.

For further information write to the company, or use the Request Card at page 18. Circle No. 656.

A calendar of coming conventions appears on page 69 of this issue.

CIMCO TWIN BIN

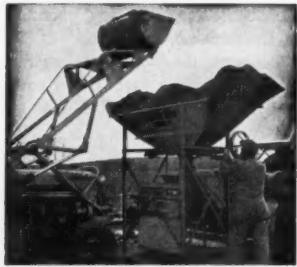
Potent Pending

Choose the RIGHT Twin Bin for a practical answer to QUICKER—CHEAPER—EASIER—DEPENDABLE concrete mixing.

Models A — AW Twin Bin are used with 1-2-3 bag mixers and built to fit your standard wheel-borrow scales for economy.

Models B — BW Twin Bin are used with 1-2-3-4 bag mixers and larger pours.

Models AW — BW are permanently mounted upon a rubber tired trailer. You may obtain the trailer if you want to convert your Models A-B to mobile units.



Twin Bin Model A is shown being loaded. The low height allows the use of small low-priced loaders or cranes. The operator is moving the positive shut-off valve to weigh accurately the first time.



Twin Bin Model BW is shown in the forward dumping position. The operator releases the weighed aggregate at the right spot in the mixer skip. The Scale Bin moves on grained packed, jaw protected bearings. Its movement allows it to be used with some bituminous plants. Note the screw-jack leveler below left.



Twin Bin Model BW is shown working and being loaded on its permanent trailer mounting. It is easy to set up work, operate and pull. The tongue is in the fold-up position. This model stores and weighs larger batches. Note the Stock Bin with its divided wall and the beams and working parts of the built-in 1000 lb scales. Three men are doing this job.

For Complete Information On How to Use and Choose the Right Twin Bin for Your Job, Write

CIMCO
BOX 422, MARSHALLTOWN, IOWA, U.S.A.
Write for information on distributor territories now open



building a nest
for giant skybirds
with

LACLEDE REINFORCING BARS

Laclede Reinforcing Bars provide a sturdy backbone for the giant new Trans World Airlines hangar taking form at Lambert Municipal Airport, St. Louis. Representing the perfect balance between high strength and maximum anchorage, these multi-rib steel bars are the first choice of more and more contractors throughout America.

OTHER LACLEDE
CONSTRUCTION
PRODUCTS

Steel Joists • Welded Wire Fabric • Pipe •
Spirals • Conduit • Electric Welded and Gas
Welded Tubing • Form and Tie Wire •
Corrugated Steel Centering



LACLEDE STEEL COMPANY
St. Louis, Mo.

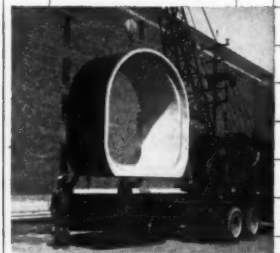
Mulching Machine

■ A new mulching machine is offered by the Papec Machine Co., 30 W. Main St., Shortsville, N. Y. The mulcher is an adaptation of the Papec Model 181 harvester.

Powered by its own engine, the mulcher is towed behind a truck carrying the mulching material. Two men on the truck open the bales and toss the material onto the feed table of the Papec machine, which chops it and blows it over the seeding. A third man rides at the back of the mulcher and swings the delivery pipe back and forth to direct the spread of the chopped material. The machine can be set for several different lengths of cut material.

For further information write to the company, or use the Request Card at page 18. Circle No. 659.

flatten
cost curves
with **UNIVERSAL**
Flat-base pipe



conduits



highways



industry

Pre-cast concrete pipe saves up to 30% over built-in-place methods. Easy installation. Up to 100 feet of UNIVERSAL Flat-base pipe can be laid and covered in one day!

Built for heavy duty, low maintenance. Flatten your cost curves . . . specify UNIVERSAL Flat-base concrete pipe. Write . . . we'll tell you more.

**THE UNIVERSAL CONCRETE
PIPE COMPANY**
297 SOUTH HIGH STREET
COLUMBUS 15, OHIO
A subsidiary of the American-Marietta Co.

CONTRACTORS AND ENGINEERS

New Portable Plant Washes and Screens Sand and Aggregate

■ A rubber-tire-mounted washing and screening plant for precrushed aggregate designed for production from sand bars or gravel pits has been announced by Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn. The Model 412-VW plant features a large vibrating screen for accurate separation and a long, twin-screw dehydrator for washing the material and squeezing out dirt and impurities. The capacity of the plant is 100 to 150 tons per hour, and it will readily produce 75 tons of clean sand per hour when the material contains not more than 50 per cent gravel.

Both sand and coarse aggregate can be produced, with the amount of fines retained or wasted controlled by the regulation of water flow and the adjustment of the overflow weir and baffle height.

All conveyors fold for travel. Each is driven from the plant and is controlled by a clutch from a lever on the operator's platform. The power unit is mounted over the rear equalizer and need not be removed for travel.

Plant units include a Pioneer Model 24G reciprocating-plate-type feeder with a 6-foot-square hopper and a trap grate; a 4 x 12-foot, 2-deck, eccentric - type vibrating screen; a 22-inch x 20-foot twin-screw Eagle dehydrator with large settling tank, an adjustable overflow weir and baffles; a 24-inch x 32-foot feeder conveyor, a 30-inch x 18-foot sand-delivery conveyor, and a 24-inch x 14-foot oversized delivery conveyor.

The power requirement is 60 hp continuous. The water required will run to a maximum of 700 gallons per minute at 50 psi pressure. Wheel-base dimensions are 24 feet 3 inches. Traveling width is 8 feet, and height is 13 feet. Total weight with a power unit is about 48,000 pounds, 30,000 pounds on the rear equalizer and 18,000 pounds on the front axle.

For further information write to the company, or use the Request Card at page 18. Circle No. 617.

Present national highway and road systems, built for 20,000,000 cars, are now being used by 54,000,000 vehicles. California ranks first as to volume of traffic on highways, and New York is in second place.

STANDS UP TO SEVERE USE and even abuse



One word describes a Hayward — ruggedness. Yes, it's as tough, strong, sturdy as a bucket can be — and even more so. Extreme simplicity, little if any upkeep, high operating efficiency! Details on request. Write! THE HAYWARD COMPANY, 50 Church Street, New York 7, N. Y.

HAYWARD BUCKETS
CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES
famous for performance since 1888

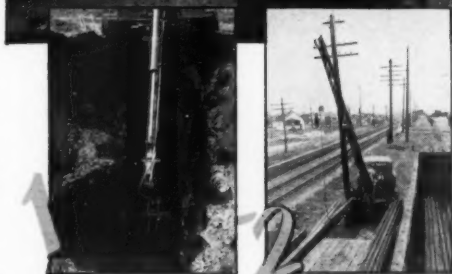


◀ The new Pioneer Model 412-VW portable sand-washing and screening plant is shown here working with a Pioneer bottom-deck-feed portable aggregate plant.



**LOW-COST
VERSATILE**

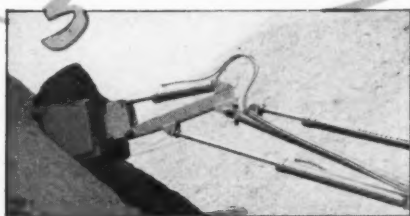
HOPTO
GIVES YOU
3-WAY
WORK CAPACITY



DIGGER

CRANE

SHOVEL



SIMPLE TO OPERATE... FAST CYCLING... 200' SWING

There is no longer any need to just wish for a mobile crane, a fast cycling power shovel, with a capacity of 40 cubic yards per hour, a portable digger that can do 'straight-down' digging to a depth of 11' !!! You get them all in the low-cost truck HOPTO. Just mount this completely hydraulic unit on any 1½ ton or larger truck that still runs but which may have been already completely charged off on your equipment inventory! Now you have a mobile Digger-Shovel-Crane with world-famous work capacity and at the lowest possible equipment investment!

The simple handling of HOPTO is quickly mastered by any handy man or utility man. Four hydraulic controls are conveniently banked in front of the operator who has unrestricted visibility of work at hand. Hydraulic stabilizers assure a firm loading platform, take weight of heavy lifting off the truck springs.

Crane boom is optional equipment, may be equipped with hydraulic control grapple. Backhoe and shovel buckets are available in a wide variety of sizes and designs for material handling and for digging, trenching and excavating in all types of soils.

CHOICE OF MODELS

All the outstanding features of the truck-mounted HOPTO are also available in other models to best fit your needs at lowest possible equipment investment. Self-powered trailer models, power take-off trailer type models and HOPTO units for rear mounting on track type tractors are available in addition to the two models shown.

SELF-POWERED HOPTO UNIT

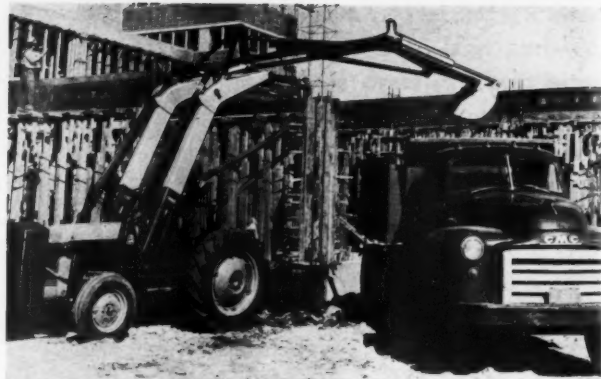
Model SPC HOPTO is a complete Badger-built unit powered by an MM 206-4A. Other power units can be furnished on request. Unit has a bearing pressure of only three pounds per square inch to permit uninterrupted operation in swampy or muddy soils. Comfortable seat for operator swivels for easy access to operating and driving controls. Extremely long reach permits all HOPTO models to work all of a thirty-two foot semi-circle without moving unit.



Write TODAY for complete information and specifications of the HOPTO model that best fits your needs!



BADGER MACHINE CO.
WINONA, MINNESOTA • DEPT. E



At right, the Davis Pit-Bull with backhoe attachment. The trencher attachment, at left, is one of eleven units that mount on the new Davis Pit-Bull front-end mechanism for Ford and Ferguson tractors.

Rear-End Mechanism For Wheel Tractors Mounts 11 Attachments

■ One basic unit with eleven different attachments for use on all Ford and Ferguson tractors is announced by Mid-Western Industries, Inc., 1009 S. West St., Wichita, Kans. The new rear-mounted Davis Pit-Bull may be obtained with whatever combination of attachments is needed.

The eleven attachments include a $\frac{3}{4}$ -cubic-yard bucket, a backhoe that digs 10½ feet, a trencher with a digging depth of 5 feet, an 8-foot rotary broom with a 60-inch operating arc for sweeping at angles, a 72-inch dozer blade, a swinging crane, a 45-inch roller with 100 psi pressure, a rotary mower which pivots 180 degrees for side mowing, a lift fork with a capacity of 2,500 pounds, a 350-pound hammer, and a 5-foot auger. A cab available as an accessory for the Pit-Bull is made of Plexiglas and has a light metal frame and sliding windows.

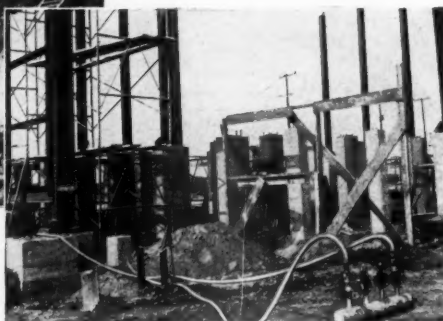
Installation is done by Mid-Western dealers. The process involves reversing the tractor's seat and controls and putting a Mid-Western synchro-mesh transmission between the clutch and standard transmission. This seating and control arrangement, the manufacturer emphasizes, makes the operator comfortable, allows him to see exactly where he is working, and gives him fingertip control over both the tractor and the attachment. With the special synchro-mesh transmission, the Pit-Bull has four speeds in each direction. The direction can be changed without shifting gears.

Twin hydraulic rear-lift arms, mounted on the machine's superstructure, form the remainder of the basic unit. The superstructure carries the weight of the unit without strain on the center of the tractor. An extra-large oil reservoir on the front of the tractor contains the pump and filter and also serves as a counterweight.

For further information write to the company, or use the Request Card at page 18. Circle No. 551.



Another tough construction job proves how U.S. Royal Cord Air Hose can take a kicking around



The above photos show U.S. Royal Cord Air Hose at work on another big construction job—a \$10,000,000 addition to an oil refinery in California. A fast-moving, closely-budgeted time schedule puts plenty of rough treatment on every foot of this hose, yet the men on the job "swear by it." So also does the construction company—it will use no other air hose.

The simple fact is that U.S. Royal® is the only cord air hose built like a tire—to take punishment like a tire. The cord plies floated between layers of high-gum rubber are resistant to the shearing action caused by external blows—an advantage not found in conventional braided reinforcements. It has been run over by 50-ton cranes on tractors, and trucks carrying steel girders or gravel. Yet no damage resulted, even though no cribbing was used. The men just don't have the time to "coddle" hose. And despite its great

strength, U.S. Royal is amazingly flexible and easy to work with. The Neoprene tube of U.S. Royal Cord Air Hose is highly resistant to oil.

You can count on this: U.S. Royal Cord Air Hose will save you time and work, and pay for itself over and over. On job after job it will deliver—and last longer than you've thought any air hose could last. Get in touch with any of our selected distributors of any of our 27 District Sales Offices, or write to the address below.

Remember—only you can prevent forest fires.

"U.S." Research perfects it... "U.S." Production builds it... U.S. Industry depends on it

UNITED STATES RUBBER COMPANY
MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes
Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting



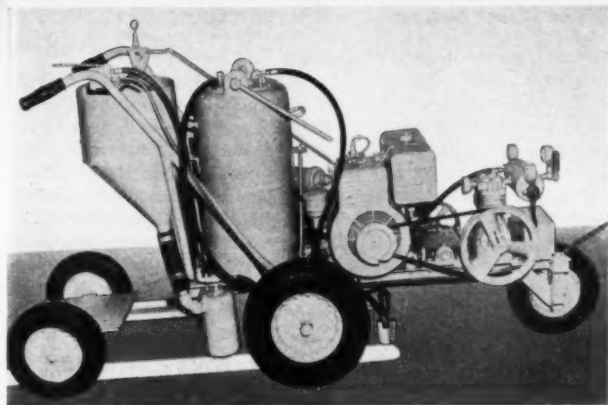
**HUNT
PROCESS**

CONCRETE
CURING
COMPOUNDS

NOW AVAILABLE
IN SOUTHEAST

Write for complete information
HUNT PROCESS CORP., SOUTHERN
RIDGELAND, MISSISSIPPI
Western Factory & Main Office
HUNT PROCESS COMPANY, INC.
7012 Stanford Ave., Los Angeles 1, Calif.

CONTRACTORS AND ENGINEERS



The Econo-Liner Model 8088 line marker has a two-wheel trailer on which the operator rides.

Traffic-Line Painter Is Riding-Type Unit

■ A new power-driven riding-type line marker for spraying traffic lines on rough surfaces has been developed by the Universal Mfg. & Sales Co., 5211 Pacific Blvd., Huntington Park 5, Calif. The Econo-Liner Model 8088 has a two-wheel trailer which the operator rides. A 10-gallon explosion-proof tank makes it possible to paint a line from 2 to 6 inches wide for from 2 to 5 miles every hour. Double lines or skip lines can be painted with minor accessory attachments.

The machine is powered by a 3.1-hp one-cylinder four-cycle gasoline engine with a 50 per cent power reserve. A two-cylinder single-stage 9.3-cfm displacement compressor delivers 50 per cent more air than is needed for spray and control equipment.

This model also features a patented tank cover with a quick-locking device, an adjustable pressure-control safety valve on the air receiver, and air-actuated spray guns for sharp cutoff. The three-wheeled line marker travels on pneumatic rubber tires and ball-bearing-equipped wheels. The controls are located at the handlebars. Complete accessories include bead hopper and dispenser, automatic skip-line control, hand-type spray guns, agitators, and cleaners.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 651.

Bentley Promotes Three

Three promotions have been made by The A. Bentley & Sons Co., general contractors, Toledo, Ohio. Norman J. Zumbunn, former assistant chief engineer, is now chief engineer; Ray Scholz, former estimating engineer, is chief contract engineer; and Russell Gist, former chief draftsman, is chief designer.

With the exception of a brief period in which he was assistant maintenance engineer with the state highway department, Mr. Zumbunn has been with the company since 1927. He is a member of Tau Beta Pi, national honorary engineering society. Mr. Gist has worked on almost every large contract done by the company in the past 30 years. Mr. Scholz, with the company since 1949, is secretary-treasurer of the Toledo Section, American Society of Civil Engineers.

JUNE, 1954

NSPE Elects New Officers

Clarence T. Shoch, assistant to the vice president of the commercial department of the Pennsylvania Power & Light Co., Allentown, Pa., has been elected to the presidency of the National Society of Professional Engineers for the 1954-55 administrative term. Mr. Shoch, a well known electrical engineer, succeeds T. Carr Forrest, Jr., of Forrest & Cotton, Dallas, Texas.

At the same time, the following engineers were elected vice presidents for the various areas covered by the NSPE: Louis F. Frazza,

northeastern area; M. F. Wooten, Jr., southeastern area; Virgil E. Gunlock, central area; John B. Jardine, north-central area; Robert J. Rhinehart, southwestern area; and Orland C. Mayer, western area.

Russell B. Allen, professor of civil engineering at the University of Maryland, was elected to his seventh term as treasurer of the society.

At least \$105 billion, spent at the rate of \$7 billion a year for 15 years will be needed to bring our highway system up to date, estimates L. L. Colbert, president of the Chrysler Corp.



Send just ONE man

to handle scattered maintenance jobs

The "one-man road gang" pictured above—a D Tournapull—requires only a phone call to get rolling at 28 mph to any work assignment. Operator just hops on and goes. No blocking, no planking, no time-consuming loading or unloading. A mile is only a couple of minutes away. Rig drives anywhere—over paved road or cross-country. Big low-pressure tires do not damage pavement, curbs, or soft shoulders.

Works alone

The D Tournapull self-loads up to 5 bank yards, cuts to grade accurately, hauls any distance, spreads in con-

trolled layers. One man, with this one machine, can fill mud holes, haul and spread gravel, re-build secondary roads, clean ditches, construct driveways, do dozens of other scattered service jobs for you. Equipped with 8' blade the "D" handles small dozing jobs. With a 9' V-blade, it plows snow. Because of its open top, it can be shovel or hopper-loaded. It works easily in tight quarters . . . can turn around non-stop in a space only 25'4" wide. This mobility, plus its versatility and 28 mph speed, helps it outproduce larger, more expensive crawler-scrappers, even on very short hauls.

Year-round interchangeability

And here's another advantage. You can easily interchange other LeTourneau-Westinghouse trailing units behind the same 2-wheeled prime-mover. For about 1/4 of original price, you can change scraper for 9-ton rear-dump body or 10-ton crane. Self-loading flat-bed trailer is also available. Trailing units can be changed in a few hours. The resulting ability to handle a wide range of assignments keeps your equipment investment working full-time.

Send for details today. Have D Tournapull demonstrated on one of your jobs . . . see its advantages for yourself! Call or write us to arrange time and place.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-636-G-b

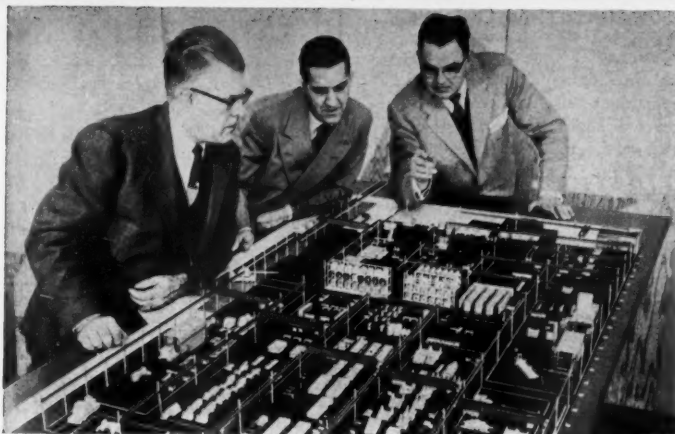


Driving job-to-job, D Tournapull can carry supplies in scraper bowl. One man, one machine can handle complete assignments.

LeTourneau-Westinghouse Company
PEORIA, ILLINOIS



A Subsidiary of
Westinghouse Air Brake
Company



Examining a 1/8-inch scale model of the Clark Equipment Co.'s plant being built in Benton Harbor, Mich., are, left to right: M. R. Dalrymple, mechanical superintendent; E. A. Smith, industrial engineer; and George Turner, plant manager of the new facility. ▶

Clark's New Plant Begun

Steel erection has started for the new manufacturing plant of Clark Equipment Co., Buchanan, Mich., manufacturer of material-handling trucks, construction equipment, and heavy automotive components. Located on a 100-acre tract on the outskirts of Benton Harbor, Mich., the new facility was designed and is being built by the Austin Co.

The building will have 145,000 square feet of space, a 25-foot clear height under the trusses with 40 x 60-foot bays, and will be of structural steel and dry-wall construction with concrete floors. The exterior will be finished with corrugated asbestos. It is expected that the plant will be in operation by the end of the year.

George Turner will be manager

of the new plant, part of the company's construction machinery division.

Clark has also appointed Jack B. Hart export manager and Charles D. Bobbitt order and distribution manager for the construction machinery division. Mr. Hart has been in the export traffic and sales department of Michigan Power Shovel Co., and Mr. Bobbitt formerly was manager of the order and distribution department of the Frank G. Hough Co.

Allis-Chalmers Division Makes Personnel Changes

A number of appointments and promotions have been made in the general machinery division of Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. In the series of changes, O. V. Tally was made director of industrial sales; J. S. Morgan, director of utility sales; and W. L. Manly, director of general-purpose equipment sales.

Mr. Tally was formerly manager of the midwest region; Mr. Morgan, assistant manager of the switchgear department; and Mr. Manly, assistant director of sales in the general machinery division.

In other changes, M. M. York was made manager of the newly created northwest region for the company and will make his headquarters in Chicago, Ill. He was formerly New England regional manager. The Hartford district office manager, John E. Smet, succeeds Mr. York in the New England post. J. H. Burrus, Jr., former Milwaukee district office manager, was named manager of the midwest region. His headquarters will be in St. Louis, Mo.

Tractor-Loader Features Include Four-Wheel Drive

■ A new bulletin on the Le Roi-Transo 1½-yard loader uses photos and sketches to point out the features of the four-wheel-drive unit. Showing the Model TLF-150 at work, the brochure illustrates how the unit's bucket-rocking action combines with four-wheel-drive traction to permit full loads.

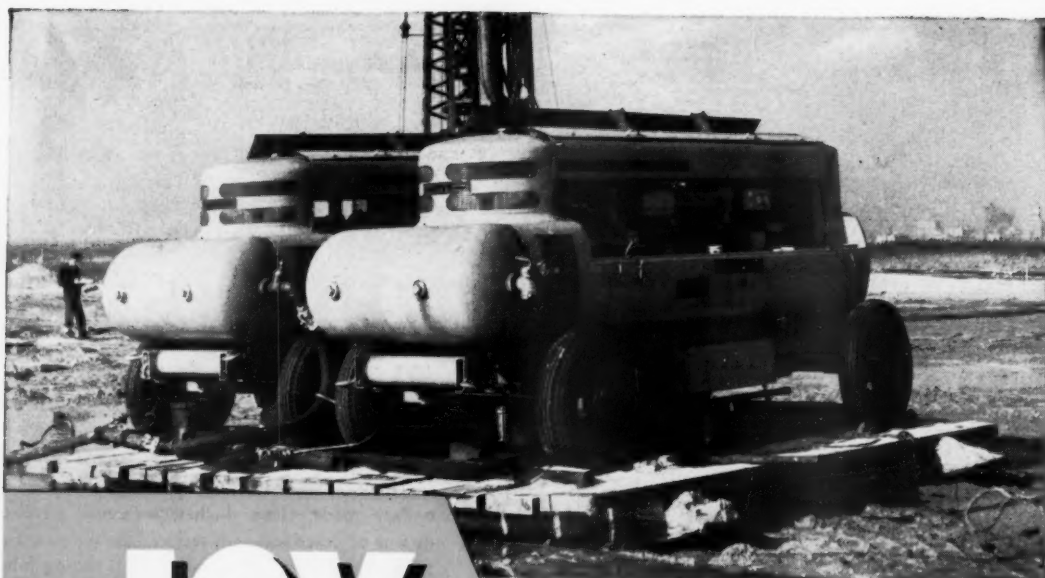
The literature states that design features built into the loader make for balance without sacrificing valuable road clearance.

One page of the bulletin discusses the 1-yard Model TL-100. This front-wheel-drive unit also has the same dumping height, 10 feet, as does the larger 1½-yard unit. A full page of detailed specifications is included for both models.

This literature may be obtained by writing the Le Roi Co., 1706 S. 68th St., Milwaukee 14, Wis., or by using the Request Card at page 18. Circle No. 658.

Here's the *BIGGEST* Portable!

Gives you 5% MORE AIR THAN ANY OTHER ON THE MARKET



JOY "630"

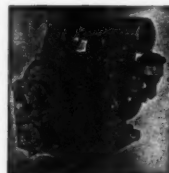
The Joy "630" is a *big* portable—output is 630 CFM—but it's designed for real portability. Light in weight, compact and rugged, the "630" is actually smaller than many other units of less capacity.

The Joy "630" is a completely self-contained compressed-air plant. Electric starter, full force-feed lubrication, "Cascade" oil cooling, two-stage compression, and many other advanced engineering developments enable it to out-produce all others. You'll find the Joy "630" a bear for work—it will operate two 4" wagon drills—and you'll find it able to cope with your heaviest air requirements. • Write for Bulletin GG-1P. Joy Manufacturing Company, Oliver Bldg., Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.

W40 C4633



Consult a Joy Engineer



TWIN PRIME PUMPS

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... Lower cost

DUAL VOLUTES, fast priming, non-clogging portable, long lasting centrifugal pumps. Distributors—write for attractive proposition.

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CONTRACTORS AND ENGINEERS

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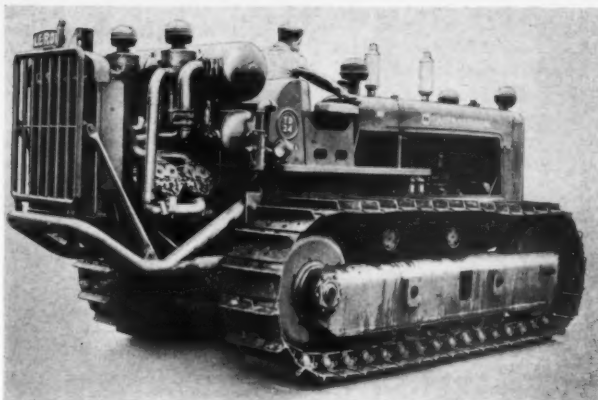
Worn Tractors Fitted With New Compressor Make Mobile Air Units

■ A new 600-cfm compressor is designed for mounting on crawler tractors to bring compressed-air power to remote areas. The Le Roi 600 CTM compressor can be mounted on crawler tractors having weak worn tracks incapable of producing enough traction for dozing or scraping operations. In this way, a newer crawler will be relieved of the expensive and slow job of towing a heavier, harder-to-handle four-wheel portable compressor. The compressor mounts the International Harvester TD24 and Caterpillar D8 tractors.

The compressor can also be used with side booms and twin wagon-

drill air-feed assemblies of the Le Roi-Cleveland SB30 or PL30 class to

convert old tractors into fast-moving integral drilling units. This not



The new Le Roi Model 600 CTM compressor, mounted on an International-Harvester TD24 crawler tractor makes a mobile air source that can be taken into remote areas.

only extends the useful life of the worn tractor but also makes a unit with a drilling pace accelerated by the resulting mobility. Also, this integral weight-saving unit reduces fuel and maintenance costs, since the same engine powers both tractor and compressor.

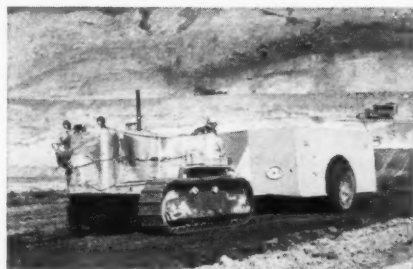
Standard equipment includes an independent clutch to disengage the compressor from the power-takeoff shaft, a deep crankcase for operation at a 30-degree angle, complete compressor controls including slow-down of the engine, heavy under-carriage and intercooler guards, air receivers, and heavy-duty oil-bath air cleaners.

For further information write to the Le Roi Co., 1706 S. 68th St., Milwaukee 14, Wis., or use the Request Card at page 18. Circle No. 548.

BROS tip sheet

EQUIPMENT NEWS FROM A FAMOUS NAME IN ROAD MACHINERY

HERE'S HOW ROLL-O-PACTOR* CONTINUES TO REVOLUTIONIZE "BIG JOB" COMPACTION



Patented Bros design equalizes weight distribution over all four wheels on roughest terrain. "Superload" compacted Roll-O-Pactor* is backed by the entire Bros factory and distributor service organization.

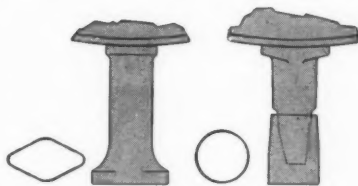
*Bros Roll-O-Pactor is patented in U.S.A., Canada and Mexico.

You spread earth in 18" lifts instead of 6" lifts, and use a 50-ton Bros Roll-O-Pactor* to compact to greater density with fewer passes. You break the slow compaction bottleneck, and rain doesn't keep you off the job as long as it does with other compaction equipment. Government and private job studies have proved beyond question the value of this Roll-O-Pactor* that others are trying to copy, even under possible patent infringements.

TWO NEW TAMPER FOOT DESIGNS NOW OFFERED BY BROS

Illustrated at right are the new Bros standard diamond-shaped tamping roller foot and the replaceable "Tamprite" foot. Both of these foot designs are now available on giant Bros "G" Series tamping rollers. Ft. psi range of the "G" series is 260 lbs. to 738 lbs.

Bros cleaner teeth are new, too. They have adjustable and reversible blades which mean that blades last longer and drums stay cleaner because blade contact can be readily adjusted.



Above left is the new Bros diamond-shaped foot with "relief" shank for easier withdrawal from soil. At right is the "Tamprite" foot with removable tip which saves time on replacement and readjustment, and lengthens foot life.

"Quickies" for your information

Since you don't want to be caught with "orphan" compaction equipment, remember that Bros is the world's largest manufacturer of pneumatic tire rollers.

Smaller Bros rubber-tire rollers are 7, 9 and 13-ton models.

Only Bros offers the widely tested and approved "Wobble-Wheel" design so popular on our smaller pneumatic tire rollers.

The medium size Bros Tamper model series offer a ft. psi range of 108 lbs. to 315 lbs. Smooth drum rollers, too.

Road Machinery Division, **WM. BROS BOILER & MFG. CO.**
1189 Tenth Avenue S.E. • Minneapolis 14, Minnesota

To get specifications and data on any of the Bros compaction products listed below, just check the items which interest you and send us this slip, along with your name, company or organization and address.

- | | | |
|---|---|--|
| <input type="checkbox"/> Bros 35 and 50-ton Roll-O-Pactors* | <input type="checkbox"/> Pneumatic Tire Rollers | <input type="checkbox"/> Medium weight Bros Series "M" Tamping Rollers |
| <input type="checkbox"/> Special Airborne Roll-O-Pactors* | <input type="checkbox"/> Giant weight Bros "G" Series Tamping Rollers | <input type="checkbox"/> Bros smooth drum rollers |
| <input type="checkbox"/> Bros 7, 9 and 13-ton | | |

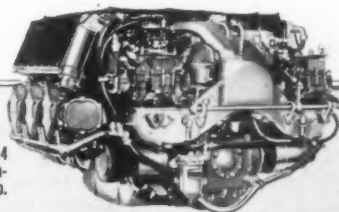
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... whether you need TWO or A THOUSAND, there's a Continental Red Seal® model Engineered and Built for Your Job

Now that the military models developed jointly with Army Ordnance are available for civilian uses, you can get Continental power for commercial applications at just about every power level from a lawnmower up to a tank. These air-cooled military series, from 375 to more than 1,000 horsepower, have been thoroughly proven under combat conditions. Their high power-weight ratio, ease of maintenance, and stamina for sustained peak loads suggest their special suitability for many jobs in the industrial field... Inquiries are invited.

PARTS AND SERVICE COAST TO COAST

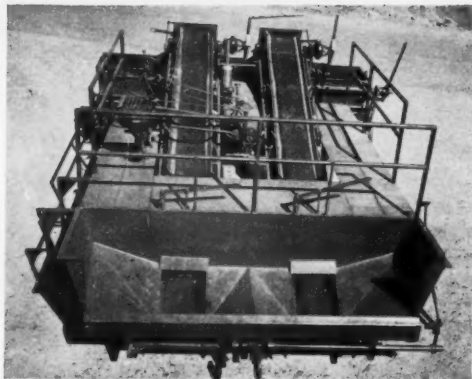


Continental A0895-4 Air-Cooled 6-Cylinder Engine, 375 h.p.

Supercharged version, designated as A0895-3, develops 500 h.p.

1819 BROADWAY, NEW YORK 23, NEW YORK • 1252 OAKLEIGH DRIVE, EAST POINT (ATLANTA) GA. • 6218 CEDAR SPRINGS ROAD, DALLAS 9, TEXAS • 3817 S. SANTA FE AVE., LOS ANGELES 58, CALIF. • 910 S. BOSTON ST., ROOM 1008, TULSA, OKLA.

Continental Motors Corporation
MUSKEGON, MICHIGAN



The Spread-Master, a new self-propelled chip spreader.

New Chip Spreader Is Self-Propelled

■ A self-propelled chip-spreader has been placed on the market by the Flaherty Equipment Co., P. O. Box 1042, Pocatello, Idaho. According to the manufacturer, only two men are required to operate the Spread-Master, which covers four to seven miles of 26-foot highway in eight hours.

The machine can spread any size or quantity of material. There are two 18-inch conveyor belts delivering material from a 10-foot dump hopper to a 13-foot spread hopper. One man operates the spreader, and the other hooks and unhooks the trucks. This permits a continuous operation if oil and chips are at hand.

The self-propelled spreader is reported to eliminate the wasting of chip by positive spread control. Overlapping and spillage on the highway are prevented. It will handle any single or tandem-axle

truck with either a large or small dump body, and it spreads to any width up to 13 feet. There is no need for brooms or patch crews. With the screen attachment on the Spread-Master, all coarse material is imbedded in the oil first, the fines filling the voids. The coarse material covers the road surface before dust has a chance to reach the oil.

The machine has hydraulic booster steering, and is made with standard parts throughout. Over-all height is 7 feet 6 inches, and its length is 20 feet 7 inches. The machine's width with spread hopper attached is 14 feet, and without hopper, 9 feet 11 inches. Approximate weight of the unit is 15,000 pounds. Six 10-ply 8.25 x 20 tires are standard equipment.

For further information write to the company, or use the Request Card at page 18. Circle No. 581.

CCI Booklet on Concrete

Concrete users will be interested in a new 40-page manual offered by the Calcium Chloride Institute. Titled "Calcium Chloride in Concrete", it is a ready reference to quantitative data and includes 20 charts and 40 illustrations referring to the various aspects of calcium chloride as it is used in modern concrete construction.

There is information on initial and final set, early and ultimate strength, integral curing, workability and density, resistance to surface wear, cold-weather protection, air-entrained concrete, and high early-strength cement. Copies of Manual CM-1 may be obtained from the institute, 909 Ring Bldg., Washington 6, D. C., on request.

Lightweight Gasoline-Powered Saw Has Heavy-Duty Reciprocating Blade



■ A new gasoline-powered saw by Wright Power Saw & Tool Co. has a blade that can cut through heavy timber and weighs less than 25 pounds complete with guide and blade. The saw is sturdy enough to fell and limb trees and to cut posts and piling, yet can be used for precision work such as trimming, notching, and ripping lumber. It will follow a chalk line and cuts a kerf of only $\frac{3}{16}$ inch, leaving a mill surface on the wood. The use of an 18-inch reciprocating blade eliminates kicking or grabbing.

The throttle on the new Wright saw is of the trigger variety and includes a unique automatic shutoff feature. If an operator should stumble or fall while using the saw, the ignition system, which grounds automatically when the trigger is released, stops operation of the saw instantly.

To reduce operator fatigue, lightweight high-strength alloys have been used in the saw's construction. A float-type carburetor with a special wick feed allows operation of the saw in all positions, including upside down. No swivels or special adjustments are required.

The design of the saw is reported to make servicing and maintenance easier. Blades can be changed in



With its single reciprocating 18-inch blade, the new Wright saw can cut through heavy lumber.

30 seconds without tools, according to the manufacturer. Sharpening is done by hand. The entire machine can be disassembled and assembled rapidly without special tools.

For further information write to the company at 292 Longbrook Ave., Stratford, Conn., or use the Request Card at page 18. Circle No. 624.

STURDILITE

Heavy-Duty FLOOD LAMPS

Available in 6-3, 12-16, 24-28, and 110-120 voltages.

Rubber Mounted Base Standard Model

For Better Light • Longer Service • Lower Cost

Especially Designed for Efficient Service on

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VERSATILITY is the keynote in SHAWNEE EQUIPMENT

FROM THIS TO THIS IN MINUTES

• Long Trenches 9 1/2 ft. deep • Loading

HYDRO-CLAM CONVERTS TO BACKHOE SIMPLY BY CHANGING BUCKET BOOMS

Ideal for large and small operators—Municipalities and Counties.

AVAILABLE FOR MOST ALL TRACTORS—One machine...convertible to perform two types of digging! This practical feature was first requested by owners of Shawnee equipment—Now it is fulfilled. It means greater economy and increased versatility—from digging long trenches 10" to 24" wide the machine can be converted to the clam for spot excavations (36-in. minimum) in just a few minutes time.

Write for specifications and name of your dealer.

SHAWNEE Manufacturing Co., Inc.

1947-M N. TOPEKA

TOPEKA, KANSAS

CONTRACTORS AND ENGINEERS

HYDRO-CLAM AS BACKHOE

HYDRO-CLAM WITH CLAM



The Charge-a-Paver attachment for the Lorain TL-25 excavator receives paving material from a batch truck while the truck remains outside the subgrade. The material is then transferred directly to the skip of the paver.

Attachment Takes Batch From Truck to Paver Skip

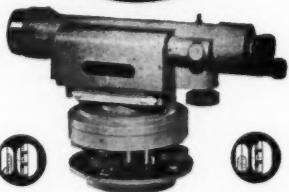
■ A new front-end attachment for the Lorain TL-25 crawler-mounted excavator transfers materials to the paver from batch trucks parked outside of the road subgrade. The Charge-a-Paver consists of a box-like pan, 10 feet long, 6 feet wide, and 14 inches deep, which may be crowded and retracted on a telescopic boom to receive and unload the paving material.

The attachment's chief advantages are that there need be no cutting up of the subgrade with batch trucks and no breaks in road forms. Because no duck-board runways are required, handling time and labor costs are saved. According to the manufacturer, fewer trucks are needed when the attachment is used, and there is less spillage. Faster skip charging reportedly results in 10 to 15 per cent greater paver output.

For further information write to The Thew Shovel Co., 28th and Fulton Road, Lorain, Ohio, or use the Request Card at page 18. Circle No. 527.

Surveying experts favor

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"NITAC" — World's only level with split bubble, erect image. One of many super-fine levels, transits, theodolites, made by Fennel's old-world craftsmen. Performance-proved in 58 countries. Send for particulars, prices.

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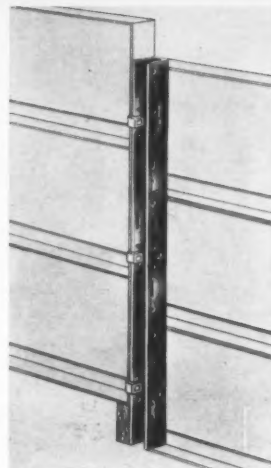
JUNE, 1954

New Step-Filler Form

■ A new step filler is a concrete form accessory announced by the Universal Form Clamp Co., 1238-48 N. Kostner Ave., Chicago 51, Ill. The new dual-purpose form is a prefabricated unit that members with Uni-Form concrete forms and can be used as a regular filler as well as a step filler.

The accessory permits continuous forming regardless of footing conditions. Walls can be formed without breaking forms. The step filler allows for unevenness in footings without breaking up the continuity of forming. It is said to reduce the number of fillers needed with loose angles and job-ripped plywood.

For further information write to the company, or use the Request Card at page 18. Circle No. 576.



A new dual-purpose step-filler form for Uni-Form concrete forms.

Why more and more truck manufacturers are shifting to FULLER



Demand from the field

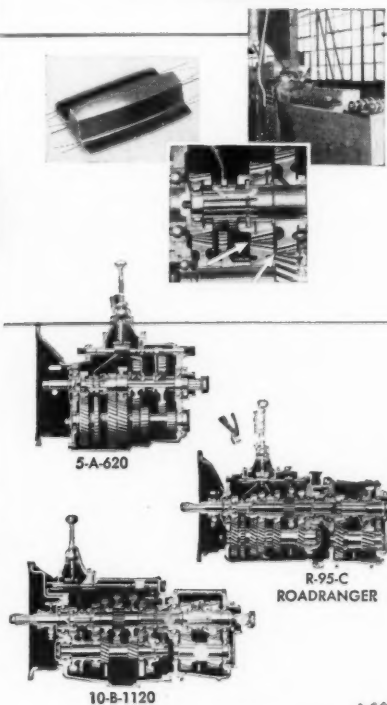
Ask the driver—the man who has to maintain engine rpm to meet round-trip schedules. Ask the mechanic—the man who has to keep the truck *on the road*. Ask the owner—the man who has to pay the bill if the transmissions fail. They'll tell you they want a Fuller Transmission . . . for Fuller has the features for more profitable trucking.

Fuller design features

Open up a Fuller Transmission . . . and you can see the "extras" Fuller provides. Take a Fuller-equipped truck out on the road and *feel* it perform. Constant mesh, helical gears mean easier, faster shifting in forward speeds. Crowning the gear teeth prevents stress . . . longer life for Fullers. Shot peening reduces metal fatigue . . . less material failure.

110 Models — 100 to 400 hp

Specify a Fuller Transmission for your on- or off-highway units and get a transmission *matched* to your load and road conditions . . . that will provide the right ratios for your job. Specify a transmission *designed to deliver* more effective horsepower . . . a Fuller Transmission.



where horsepower *really* goes to work



FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO, MICHIGAN

Unit Drop Forge Division, Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Western District Branch (Sales & Service—All Products), 641 E. 10th St., Oakland 6, Cal.



The latest model of the Kwik-Mix Moto-Bug runs on four wheels and has a new operator's seat.

Powered Wheelbarrow Carries Larger Hopper On 4-Wheel Chassis

■ A new version of the Moto-Bug power wheelbarrow has been announced by the Kwik-Mix Co., 325 W. Grand Ave., Port Washington, Wis. The new machine features a 50 per cent increase in hopper capacity, four-wheel balance, and a seat for the operator.

The Model R-15 is now available as a hopper or flat-bed platform material-handling unit. Hopper capacity is 2,000 pounds with 15 cubic feet of space available for the load. As a flat-bed platform truck, the new Moto-Bug has a load area of 34 by 54 inches. The chassis is made of a heavy steel plate welded into a single unit.

Power is provided by a Wisconsin

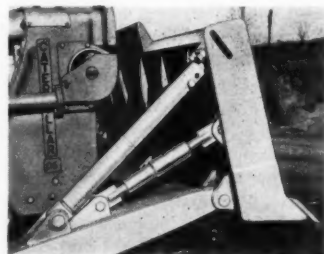
single-cylinder air-cooled gasoline engine with 3.4 to 1 reduction. It develops 8.3 hp at 3,400 rpm. Electric starting equipment is optional.

The unit can travel up to 6 mph, forward or reverse, and speed is governed by a hand throttle. A single hand lever controls forward and reverse motion. Transmission is direct from engine to transmission case through a shaft and universal joints. Both wheels drive at all times because 85 per cent of the hopper load rests on the drive wheels. Automotive steering features are built into the rear wheels, which track in line with the drive wheels.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 552.

Bulldozer Stabilizer

■ A new bulldozer stabilizer, said to eliminate looseness in adjustable-type bulldozers, is offered by the Schneckloth Excavating Co., Clinton, Iowa. With the installation of the stabilizer, the dozer blade may be held rigid in a tilted or level position.



This bulldozer stabilizer, offered by the Schneckloth Excavating Co., holds the blade rigid in a tilted or level position.

The bulldozer stabilizer can be installed in the field with four welded brackets. Installing time is reported to be less than two hours. The unit is of all-steel construction and is available for Caterpillar D6 and D7 dozers.

For further information write to the company, or use the Request Card at page 18. Circle No. 665.

LeTourneau-Westinghouse Appoints Representative

John Hunter is a new district sales representative for LeTourneau-Westinghouse Co., Peoria, Ill., manufacturer of earth-moving equipment. His territory includes the metropolitan New York area, New Jersey, Maryland, Delaware, and eastern Pennsylvania. His headquarters is in St. Michaels, Md.

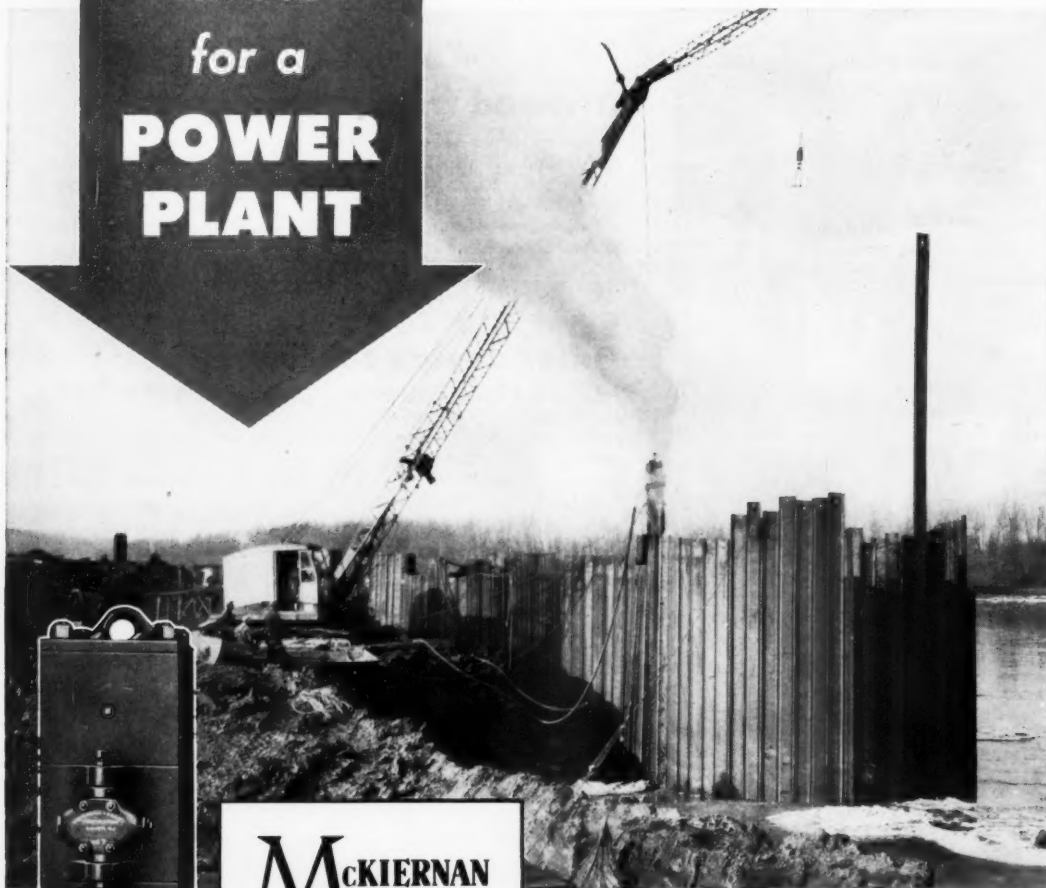
Need any information on equipment? See card bound in at page 18.

PILE DRIVING to build a "throat" for a POWER PLANT

Steam power plants need plenty of water for condensing and cooling purposes. Therefore, a power plant of this type must have access to an ample source of water, so that it can suck in and swallow all the water it needs.

To provide such an access "throat" for the new \$15,000,000 steam generating plant at Omaha, Nebraska, a steel sheet pile cofferdam had to be built at the edge of the Missouri River to enclose the area in which the intake structure had to be built.

That's where McKiernan-Terry Pile Hammers came in, for the contractor selected a No. 7 McKiernan-Terry Double-Acting Hammer to make sure that this part of the job would be done as smoothly and quickly as the remainder of the project.



**McKIERNAN
TERRY**

McKiernan-Terry No. 7 Double-Acting Pile Hammer driving cofferdam to enclose area for intake structure of new Omaha power plant. The project was under the direction of the Construction Dept. of the Omaha Public Power District, headed by Joseph Huntzinger.

McKIERNAN-TERRY CORPORATION, Manufacturing Engineers

Also Manufacturers of Coal and Ore Unloaders and Bridges, Grab Buckets, and Special Machinery
19 PARK ROW, NEW YORK 38, N. Y. • PLANTS AT HARRISON, N. J. AND DOVER, N. J.

**IT'LL PAY
YOU**

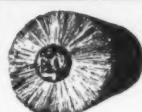
TO SEE THE
Davis

Pit-Bull

AMERICA'S MOST
VERSATILE EQUIPMENT
ON PAGE 6
CONTRACTORS AND ENGINEERS



AN ALTERNATE rope crowd front for its $\frac{3}{4}$ -yard Model 375 shovel is now available from the American Hoist & Derrick Co., 63 S. Robert St., St. Paul 1, Minn. The new front features a box-section-type boom with large-diameter boom-point sheaves and a wide cast-steel boom foot. The single rigid dipper stick is built for heavy digging. The pitch angle of the dipper can be changed by simply removing one pin and placing it at the new angle. For further information write to the company or use the Request Card at page 18. Circle No. 660.



Trade in Your Old Cores

FLASH !! DO YOU KNOW

WE MANUFACTURE

ROTARY SWEEPER CORES

Most Any Popular Make To Fit

GRACE • HOUGH • LULL • ROSCO

LITTLEFORD • DETROIT HARVESTER

and Others - Send Your Specs

REFILLS—SPECIALISTS WITH SPRING STEEL WIRES AND FIBRES
REPAIRS - ANY MAKE SIZE OR TYPE - 24 HR. SERVICE

PECKERWOOD STEEL WIRE DRAGS

LARGE 6" Wide—any Length to 12 Feet

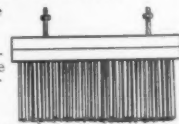


ONLY \$3.50 Foot
Buy in Lengths Assemble Your Own NAME YOURS

Drags Not Staple Set SMALL

Fits Your Frame

3" Wide
15" Long
Now \$2.50 ea



Prices Subject to Change Without Notice

SINCE VAN BRUSH MFG. CO. 1928
327 SOUTHWEST BLVD - KANSAS CITY, MO.

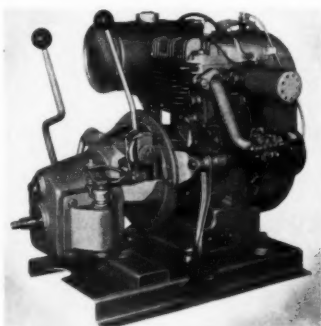
Service Bodies for Field-Shop Vehicles

■ The line of International trucks factory-equipped with service-utility bodies has been increased by addition of the Model A-96 body, available on the 134-inch-wheelbase R-130 chassis. Beside this 8-foot service-utility body, the line includes 77 and 89-inch bodies designed for field service and utility.

For further information write to the International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 589.

Small Gasoline Engine With New Power Unit

■ A new small-engine power unit is announced by the Cushman Motor Works, Inc., 900 N. 21st St., Lincoln, Nebr. Its design is based on that of the Cushman Husky Model M8, a 17.8-cubic-inch displacement four-cycle single-cylinder air-cooled engine which develops 6.0 hp at 3,200 rpm. Its clutch and transmission components can also be used with the company's Model M6, rated at 3.22 hp, or the Model M7 at 4.6 hp.

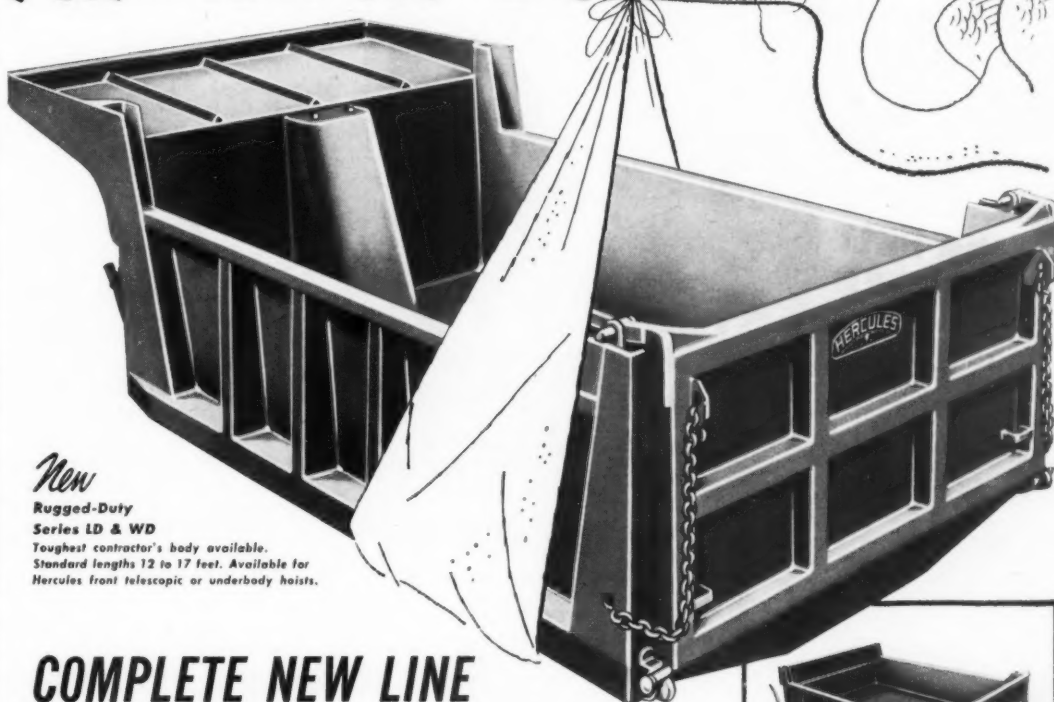


The unit consists of an engine with a bell-housing-type side plate, an automotive or manual straight-line-drive clutch, and a directly attached transmission with three forward speeds and one reverse. The clutch is of the single-disk dry-type with manual release. A spur-gear transmission provides ratios of 3:1 in low, 1.67:1 in second gear, 1.25:1 in high, and 3.86:1 in reverse.

The unit is suitable for use with winches and automotive-type vehicles.

For further information write to the company, or use the Request Card at page 18. Circle No. 531.

All New In '54



New

Rugged-Duty Series LD & WD

Toughest contractor's body available. Standard lengths 12 to 17 feet. Available for Hercules front telescopic or underbody hoists.

COMPLETE NEW LINE of Hercules Contractor Bodies!

Your answer to every hauling need... These 4 new series of Hercules bodies have many *exclusive* new features that will give you more dependable, more profitable service on the toughest construction jobs.

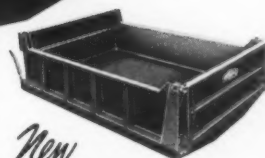
Get the most for your money. Specify Hercules at your local truck dealer or nearby Hercules distributor... or write to the factory for complete details on these new Hercules cost cutting bodies.



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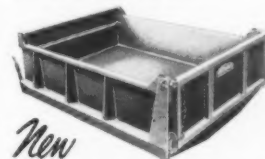
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All-Purpose Series CD. Extra duty contractor's body. Standard lengths 10, 11, 12 feet. Available for Hercules front telescopic or underbody hoists.



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Standard Series D. The standard of the industry for general contractor's work. Standard lengths 8, 9, 10 feet. Also available with removable or hinged sides, corner posts, tailgates and other contractor-preferred options.



New

Solid Steel Platform Series PL. For 80, 72, 84, 102-inch cab-to-axle trucks. Available for front telescopic or underbody hoists.

5450



A sketch of the \$2,867,000 South Side High School in Rockville Centre, Long Island, N. Y. Joseph P. Blitz, Inc., New York, N. Y., is the general contractor for the structure, which is being built on a site formerly occupied by an abandoned sewer plant.



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SPEEDER**

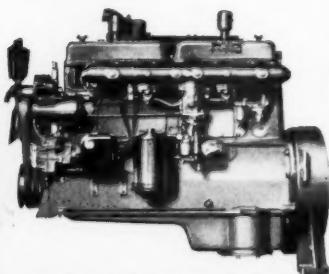
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shovel-crane**

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transportability**



WAUKESHA 140-GK—GASOLINE—
6-cyl., 4½-in. x 5½-in., 525 cu. in. displ.
Develops 99 net hp. at 1600 rpm.

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• Built to boost output as high as 25%, at lower cost per yard or ton, LS-98 keeps big jobs on schedule and turns small jobs into extra profit. Its Speed-O-Matic control and Waukesha Engine give the brute power and stamina to maintain faster working cycles without undue wear, working in the toughest materials and roughest situations.

WAUKESHA MOTOR COMPANY
Waukesha, Wisconsin
NEW YORK • TULSA • LOS ANGELES



Demolition Job Precedes Construction of School

ON LAND once occupied by an abandoned sewage-disposal plant, the new South Side High School in Rockville Centre, Long Island, N. Y., is taking shape. The \$2,867,000 all-senior high school, designed by F. P. Wiedersum of Valley Stream, Long Island, N. Y., will be a two-story building of reinforced concrete and structural steel. The facade will be face brick, with limestone features and aluminum windows. Foundations have been completed and the general contractor, Joseph P. Blitz, Inc., New York, N. Y., has steel work under way. By next summer, the project is expected to be completed.

The Blitz firm ran into one of the tougher parts of its job when it started work in January to tear down the old sewage facilities. Demolishing a two-story brick building and gas holder foundation proved to

be routine, but removing aeration tanks and sludge tanks which extended as much as 30 feet below ground level was another matter.

Demolition Job

The aeration tanks were of concrete, heavily reinforced with deformed steel bars. They had an over-all length of 165 feet, a width of 80 feet, and extended 15 feet below the surface. Reinforced-concrete walls and beams separated the tanks into individual sections.

Inside each section were machinery and piping which had to be removed. With this done, a Bucyrus-Erie crawler crane dropped a 2-ton steel ball on the tops of the tanks to shatter them. The exposed reinforcing beams were then cut with an acetylene torch.

In order to remove the exterior concrete walls and the footings of

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Not a composite rod.
Alloys in rod, not coating.
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SOLE PRODUCERS 92 N. J. RAILROAD AVE. NEWARK, N. J.

NEAREST DISTRIBUTOR
UPON REQUEST

The reinforced-concrete walls of the aeration tanks are broken by a Bucyrus-Erie crawler crane with a 2-ton steel ball. Before demolition work started, tons of machinery and piping had to be removed from each tank section.



age-disposal plant on site of new building is torn down; excavating, blasting are needed to remove underground tanks

these tanks, it was necessary to excavate surrounding earth to the bottom of the footings. Then, with the walls standing free, the footings were blasted away and the Bucyrus-Erie moved in with the 2-ton steel ball to demolish the walls. Acetylene torches were used again to cut the exposed reinforcing steel.

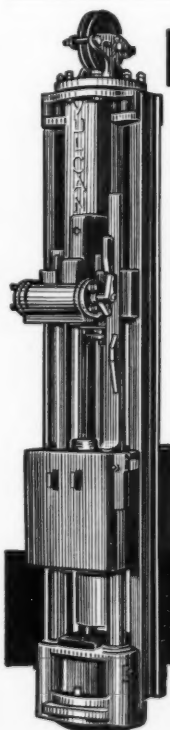
The sludge tanks, filled with sewage sludge when construction began, had to be emptied before they could be demolished. Constructed also of reinforced concrete, these tanks measured 140 feet long and 50 feet wide and extended 30 feet below ground. The contractor removed the material by pumping it into tank trucks which, according to Gustav Forsell, Jr., vice president of the firm, are specially built and airtight.

Another two-story structure on the site has been left standing, and

it will be integrated with the new school. A new foundation will be poured around its perimeter and a new brick facing with aluminum windows will go up around the existing structure.

Located at Shepperd Street, Princeton Road, and Berkeley Avenue in Rockville Centre, the completed school will include a large gymnasium, an auditorium and stage with adjoining music and practice rooms, an art studio, workshop and industrial shop, and a large biology room. There will be separate dining rooms for students and faculty members. A large bicycle shed on the grounds is planned for students who cycle to school. Wherever possible, trees now growing on the site will be preserved and included in landscaping plans. The superintendent for Joseph P. Blitz is Charles E. Devine.

THE END



FULL HEAVY BLOWS WARRINGTON-VULCAN SINGLE-ACTING STEAM PILE HAMMERS

The Warrington-Vulcan packs all the power you'll ever need at any pile driving job. Operates at medium steam pressure, delivering a moderate frequency of low velocity blows from relatively heavy ram.

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WELLMAN-WILLIAMS Material Handling Buckets open and close faster. Their smooth scoops discharge the material quickly. Double hinge shaft construction enables them to cover larger areas for bigger loads. Extra wide scoops cut time on cleanup operations.

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Address _____

City _____ State _____

Position _____ Company _____



The new Model GRD101 Dempster-Diggster.

Hydraulically Powered Excavating Shovel

■ An excavating machine on rubber-tired tricycle mounting and embodying many features of the large-capacity power shovels is announced by Dempster Bros., Inc., Dupont St., Knoxville 17, Tenn. The new Dempster-Diggster GRD-101 is an excavator shovel and front-end loader operated by hydraulic power with independent crowd and hoist action. The basic principle of the unit is the same variable crowd action found in power shovels.

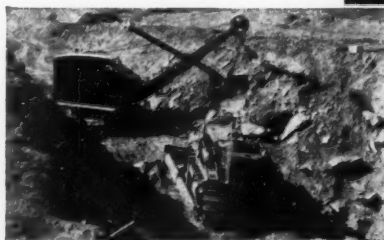
This new machine has truck speed mobility and a high dumping and digging height. A minimum turning radius is made possible largely by

its tricycle steering. Other features are an automatic bucket trip and hydraulic steering.

Loading of the bucket is accomplished by the hydraulic crowd and hoist power of the Dempster-Diggster, so that wheel traction is not needed to get sufficient excavating power. In addition, the machine has a torque converter that acts as a fluid cushion between the power source and the transmission, enabling the unit to operate smoothly.

For further information write to the company, or use the Request Card at page 18. Circle No. 547.

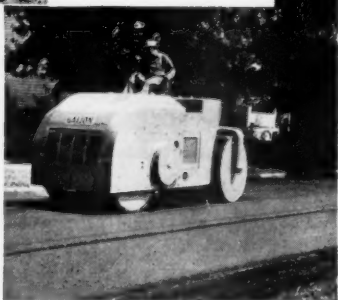
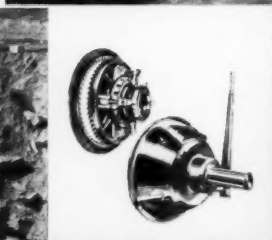
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Whatever your power transmission control requirements may be, your product will benefit by using a clutch that is exactly suited to its need. Thousands of manufacturers — in hundreds of industries — have increased the efficiency of their machines with the right ROCKFORD CLUTCHES. Our engineers are not restricted to any one type or size of clutch — but are free to specify one that is best suited to the particular operating essentials of your product.



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BORG-WARNER

314 Catherine Street, Rockford, Illinois

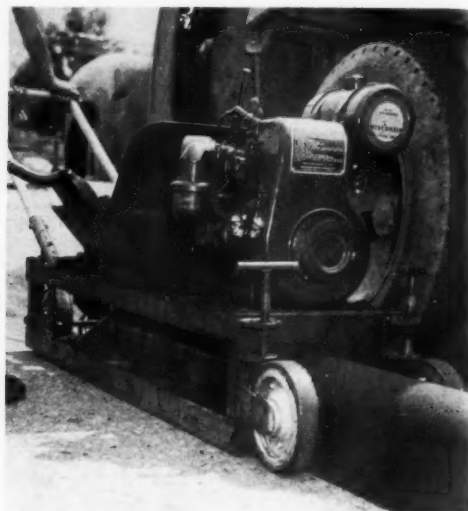
ROCKFORD CLUTCHES

Curb-Laying Machine Makes Traffic Channels

■ A machine for curb and gutter work and for traffic channelization is offered by the Canfield Corp., Suite 716, Wallace Bldg., P. O. Box 439, Salisbury, N. C. The Canfield curb layer works with concrete

asphalt is first put down to receive and bond the curb to the paved area.

Three men are required to operate the curb layer. On straight runs, up to 1,500 feet can be laid in an 8-hour day, according to the manufacturer.



The Canfield curb-laying machine is a portable unit recommended for traffic channelization work.

of a reasonably dry mix, asphalt at approximately 220 degrees F, or soil cement. The material is fed into the hopper of the machine and extruded through a worm gear into the curb mold under high pressure.

The compaction of the mass causes the machine to move backward on the line marking, where a hot application, or tack coat, of emulsified

The machine is comparatively simple to operate.

The mold used is 19½ inches long. The curb produced is 8½ inches wide at the base, 7½ inches high, and oval in shape.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 661.

Conveyor-Belt Fastener Makes Cleaning Easier

■ A new conveyor-belt fastener has top plates that are beveled at both ends. The Flexco Scraper Plates protrude above the belt as little as possible and allow conveyor belt scrapers to ride over them. Made by the Flexible Steel Lacing Co., 4607 Lexington St., Chicago 44, Ill., the new belt fastener makes the same tight-butt joint as standard Flexco fasteners. The chief advantages

the new fastener offers are less wear on scrapers and improved cleaning of the belt.

The improved fastener is made in just one size for joining belts ¾ to 1½ inch in thickness with not more than 500-foot centers. It is available in steel, monel, and Everdur.

For further information write to the company, or use the Request Card at page 18. Circle No. 566.

WISCONSIN-POWERED LITTLEFORD TRAIL-O-ROLLERS

Put on the Pressure!



These road rollers, built by Littleford Bros., Inc., Cincinnati, are easily towed behind jeep or truck, traveling on demountable pneumatic-tired wheels. Hydraulic power lifts rubber-tired trailer wheels, drops rollers into position — handled by one man, in 5 minutes. Compaction variable from 75 to 160 lbs.

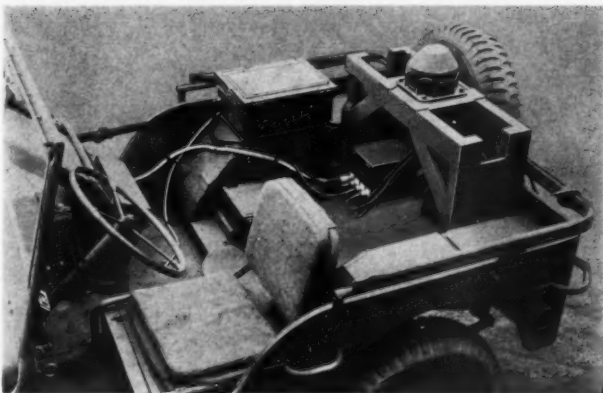
Each unit is powered by a model TF 2-cylinder Wisconsin Heavy-Duty Air-Cooled Engine. Features include tapered roller bearings at both ends of the crankshaft, fool-proof AIR-COOLING plus an easily-serviced, OUTSIDE magneto with impulse coupling for fast all-weather starts.

Write for 64-page catalog covering complete line of Wisconsin 4-cycle single-cylinder, 2-cylinder and V-type 4-cylinder models, 3 to 36 hp. Specify "WISCONSIN Power" for your equipment.



WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

CONTRACTORS AND ENGINEERS



THE MONROE ODOGRAPH is an instrument for automatically plotting the course taken by a moving vehicle. It consists of a plotting unit, a compass, and a power pack. Direction is determined by a magnetic compass, and distance is taken from the speedometer drive of the vehicle. The two are combined and mechanically plotted on a map table. Uses include map making, or plotting the position of observed objects, and surveying by finding points whose position relative to a given base is known. For further information write to the Monroe Calculating Machine Co., 555 Mitchell St., Orange, N. J., or use the Request Card at page 18. Circle No. 618.

Low-Bed Trailer Has Easy-Attaching Feature

■ A rear-loading low-bed trailer that is pulled behind a truck is made by The Schertzer Equipment Co., 32 Prospect St., Somerville 43,

lengths ranging from 12 feet 6 inches to 16 feet. All standard models are 8 feet wide, although units of any width or length can be built to



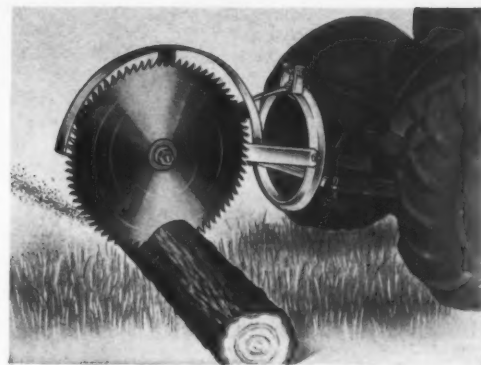
Mass. The Tow Boy trailer features a special towing device, mounted on the back of the truck, which does not interfere with the operation of the truck when the trailer is not attached. The front end of the special fifth-wheel device is self-aligning and the jaws lock automatically, making it possible for one man to attach the trailer.

This trailer is offered in three standard models with platform

specifications. Standard equipment includes lights, reflectors, air or vacuum brakes, two skid planks, loading rails on the rear, three tie-down hooks on each side, and a fifth-wheel pin for the truck.

The Tow Boy is one of 38 models of Schertzer Lo-Bed trailers with capacities of from 5 to 75 tons.

For further information write to the company, or use the Request Card at page 18. Circle No. 579.



The Rocklin Sawmobile operates from a tractor's power take-off.

Rotary Power Saw Mounts on Tractor

■ A rotary saw attachment that operates from a tractor's power take-off is made by the Rocklin Mfg. Co., Sioux City 2, Iowa. The Sawmobile attaches to three-point-hitch tractors. In its vertical position, this machine cuts heavy logs on the ground, eliminating dangerous lifting. The machine may also be used in the horizontal position as a tree

feller and brush clearer. One man safely operates the unit from the tractor seat.

The machine has a 30-inch steel blade. The entire unit is lifted by the hydraulic lift of the tractor.

For further information write to the company, or use the Request Card at page 18. Circle No. 575.

WALTON'S FAMOUS EverForm PLASTIC SURFACED CONCRETE FORM PANELS provide maximum re-use value in all types of concrete form work. The sleek, durable, diamond-hard surfaces assure super-smooth concrete, longer "on the job" service and the ultimate in re-uses. The inner core of EverForm panels is waterproof (EXT-DFPA) Douglas Fir Plywood. Produced by one of the nation's pioneer Fir Plywood Manufacturers.

Samples on request

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General Sales Office
644 East 38th Street—Suite #205
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**"WE SAVE TIME...
Labor and Maintenance Costs
with our HI-LECTRIC®
CONCRETE VIBRATORS!"**

says: James Farwell, Eqt. Sup'l.
Swan Construction Company
Newport, Kentucky

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PROOF...

I used HI-LECTRIC Concrete Vibrators on 8" soaking pit walls, 40' wide by 200' long. They were so heavily reinforced with steel, including 2" x 2" x 33' long billet type vibrators convinced us HI-LECTRIC was the only unit capable of handling the job efficiently and economically.

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James Farwell

Place concrete faster —
get a better looking job —
more economically

HI-LECTRIC "MAGIC HEAD"
CONCRETE
VIBRATOR

THE
COMPLETE
ASSEMBLY



NOW one man can actually place concrete faster and better with a HI-LECTRIC than two or three men on other types of vibrators. Only the HI-LECTRIC has the "Magic Head", far lighter, far more efficient without flexible shafts or in-the-way power units. The power source may be as far as 200 feet from the vibrator and still permit one man to vibrate 1 1/2" slump and up to 3" aggregate more quickly. Write for new catalogue.

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Load Rated

means
**safety
on the
job!**

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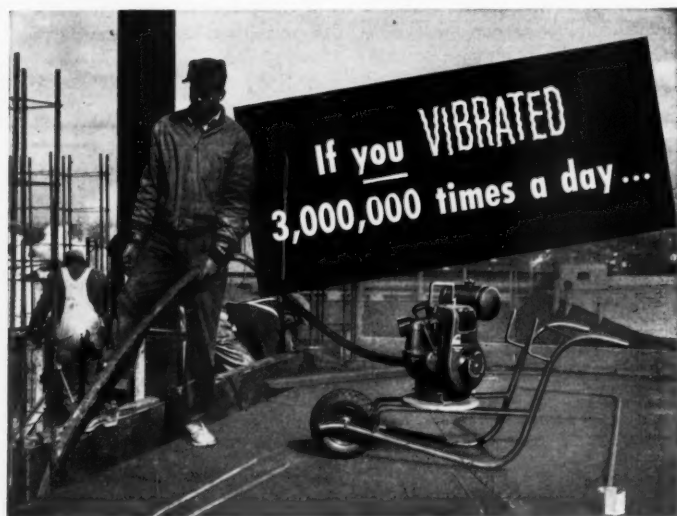
Portable Generators Are Lightweight Units

■ Light weight for easier carrying has been stressed in the two new engine-generators just announced by the Wincharger Corp., Commerce

Bldg., Sioux City, Iowa. The Model F2500 delivers electricity and has an output of 2,500 watts. The Model F3000 delivers ac current and is rated at 2,000 watts continuous capacity, with a 3,000-watt starting capacity. Each unit has four 115-volt outlets and each weighs 148 pounds.

The light weight of these two units has been achieved partly through the use of an aluminum base and aluminum guard, as well as a more compact design. The Wisconsin AKN and Briggs & Stratton No. 14 engines supplied with these units are powerful enough to develop the necessary horsepower for running a portable tool.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 568.



... you'd have to be rugged. Masters are.

Few pieces of equipment have to take this kind of a beating. 9,500 to 12,000 vibrations per minute against abrasive bits of stone, in wet cement. Imagine yourself inside one. Rough!

That's why it pays to buy *only the best* in vibrators... and why the *service* you get is just as important as the vibrator itself.

No vibrator is made with more care or better materials, than the Master... and our nearest distributor is ready with the *service* you want. Try him. See for yourself.

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□ **Turn-A-Trowel.** Floats and finishes, rigid blade mounting gives precision finish; float and finish blades in single unit, can't get lost; gas and elec.; 34", 48" sizes.



□ **Concrete Vibrator.** 9,000 rpm vibration, yet lightweight, rugged, gives long service; gas and elec.; wheel mounting available; accessory tools; 1½ to 6 hp power units.



□ **Remote Power Vibrator.** This "Hy-cycle" runs 2 high-speed vibrators (10,300 rpm) as far as 300' from power unit; mounted on wheelbarrow, wt. only 172 lbs.; 6.6 hp engine.



□ **Midjet Trowel.** New. Lightweight, one man carries; gets into tight spots; only 24" across yet does top trowel job 6 times as fast as by hand. 70 lbs.; 1.6 hp engine.



□ **Portable Generator Plants.** AC or DC; gas, diesel, natural gas engines; ½ KW to 12.5 KW; portable mountings. Also continuous duty plants up to 20 KW Floodlights.



□ **Vibrating and Finishing Screed.** Produces better quality slab than any other method we know, by superior deep vibration. Mixers can't keep up with high speed strike-off, compaction and finish (follow up with broom, bull float or Turn-A-Trowel). Handles low slumps, 3½" down to zero. Gas or elec. (any voltage, phase or cycle); 6' to 30' lengths.



□ **Portable Space Heater.** Clean, instant, odorless, heat blown where you want it, rugged, longlasting, trouble-free; uses kerosene or fuel oil; 160,000 to 400,000 BTU.

MASTER

SEND FOR CATALOGS and full information. Check boxes above, under products you're interested in. Clip lower half of ad and mail to Master Vibrator Co., 133 Stanley Avenue, Dayton 1, Ohio

NAME _____ COMPANY _____
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THIS 9-WHEEL Welco vertical-action pneumatic-tired roller is designed to eliminate bending and breaking of wheels and spindles and is said to compact uniformly. The 9-ton-capacity unit features individual wheel mountings for quick repair. For further information write to the Welded Products Co., 525 N. Kentucky, Oklahoma City 4, Okla., or use the Request Card at page 18. Circle No. 664.

New Aluminum Stages of Rigid Construction

■ A complete line of all-aluminum stages for construction work is now being produced by R. D. Werner Co.,

Due to the deep side-rail truss construction, no cable trussing is necessary, even in the longest stages.

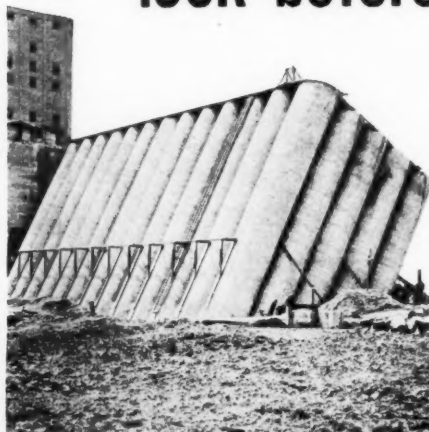


Inc., 295 Fifth Ave., New York 16, N. Y. The stages, made of tempered aircraft-type aluminum alloy with a deep-truss construction, are reported to be more rigid than most other units. A 30-foot model is said to support a 500-pound weight in the center with very little deflection.

The stages are made in a complete range of sizes from 8 to 30 feet. Widths range from 12 to 28 inches to fit standard stirrups.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 526.

look before you lean



Transcona Elevator, Canadian Pacific Railway, Winnipeg, Canada, which tipped 27°—righted by the Foundation Company Ltd. of Canada.

An elevator tips—a bridge sags—a building settles—a dam goes out—costly and serious mistakes in construction work. That's why it pays to make test borings before designing foundations. And, when you investigate subsoil conditions, you want the best—ACKER! For, Acker makes a complete line of low-cost, easy-to-operate soil sampling equipment—from hand to power driven tools.

Remember, too, Acker's 33 years of experience in designing and building soil sampling and core drilling equipment ONLY, is your guarantee of dependable, satisfactory operation.

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Manufacturers of a complete line of Diamond and Shot Core Drills, Drilling Accessories and Equipment



Free!

Write today for this complete, illustrated collection of information about soil sampling. Ask for Bulletin 25 C&E.



The Galion Allsteel Model 800-T hoist and Model 12N-5 dump body.

Offer Hydraulic Hoist And New Dump Body

■ A new hydraulic hoist and an 11-foot lightweight dump body are announced by the Galion Allsteel Body Co., Galion, Ohio. Known as Allsteel Model 800-T, the hoist is designed for tandem-axle mounting and is suitable for the operation of 5, 6, and 7-yard bodies with maximum payloads of 12¼ tons.

The body, designated as Model 12N-5, is of high-tensile or high-resistant steel construction. The ends are 6 inches higher than the sides. Other features include reinforcing side-board gussets, a double-acting box-type tailgate, rub rails, side braces, and a reinforced quarter-roll cab protector. The combination understructure has 4-inch channel cross members and 5-inch longitudinal. The body pivot is 14 inches.

Combined body and hoist weights are 3,150 pounds for the 5-yard body, 3,250 pounds for the 6-yard

body, and 3,350 pounds for the 7-yard body. The manufacturer points out that these light weights permit the carrying of greater payloads.

For further information write to the company, or use the Request Card at page 18. Circle No. 662.

New Film on Perlite

The development of perlite and its use in fireproofing plaster and insulating concrete are illustrated in a new sound-color film released by the Perlite Institute, 10 E. 40th St., New York 16, N. Y.

The 16 mm film shows the mining and preparation of perlite, as well as its use in construction.

The film may be obtained from any member company of the institute. Further information may be had by writing the institute.



In this new blasting machine offered by the Atlas Powder Co., the operator keeps the firing button depressed with his thumb while he cranks the generator up to full output. When condenser loading reaches 450 volts, as registered in the meter atop the machine, a relay closes and the explosive charge is fired.

New Blasting Machine Generates Own Current

■ A new portable generator-operated blasting machine of the condenser discharge-type is available from the Atlas Powder Co., 904 Market St., Wilmington 99, Del. It is believed to be the first condenser discharge-type blasting machine utilizing a high voltage dc generator directly connected.

The new machine, developed by the Fidelity Instrument Co., of York, Pa., with Atlas engineers, is completely self-contained and always ready for use. A specially wound permanent-magnet dc generator is hand-cranked through a train of gears which permits cranking speeds to remain moderate. To prevent firing before the condenser is fully charged, an accurate relay is wired into the firing circuit.

Although the actuating button can be depressed while the operator is building up the charge in the condensers, the firing circuit cannot be closed until the condensers are delivering a full 450 volts to the relay.

For further information write to the company, or use the Request Card at page 18. Circle No. 513.

PATCH PAVING At Lower Cost with WYLIE REPAIR UNITS



Portable Hot Asphalt Plant Single Unit Heats & Mixes

Tow your PATCHMOBILE MODEL PM-215 to the job . . . and have all the equipment you need for hot asphalt patches! Features rotary dryer, asphalt tank, pugmill, power asphalt pump, spray attachment, volumetric asphalt measuring device and fuel-heating compartment . . . all in one unit. With Patchmobile PM-215 there's no manual handling of aggregate and asphalt from charging hopper to discharge chute.



Truck Tailgate Asphalt Mixer Compact Pugmill and Heater

Use HEAT-A-MIX to make cold stockpile material as workable as fresh hot-plant mix! This compact, high-capacity pugmill and material heater has its own gasoline engine and propane heating system. Heat-A-Mix mounts quickly and easily by interchanging with truck tailgate.

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**FELKER
DI-MET
MODEL
252**

**CUTS MORE
FEET PER DAY!**

**LENGTHENS
BLADE LIFE!**

**LOWER COST-
PER-CUT!**

MAKES MORE FOOTAGE PER DAY. Model 252 is SELF-PROPELLED! Cuts faster, requires no tiresome pushing on long straight-a-way-cuts! Eliminates frequent rest periods and loss of footage!

DIAMOND BLADES LAST LONGER—Smooth, uniform travel eliminates sudden bumps, jolts, side deflections and similar causes of diamond wheel damage. Field reports show up to **DOUBLE** the life from your diamond wheels!

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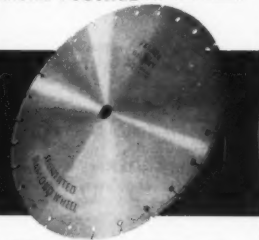
RIGHT OR LEFT HAND OPERATION—Spindle uses diamond wheel on either end.

HYDRAULIC LOWERING AND RAISING MECHANISM eases blade into and out of cut, minimizes blade shock.

WORKS CLOSE TO WALLS, CURBS, ETC. Special hinged blade guard lifts up, exposes wheel for close-up jobs.

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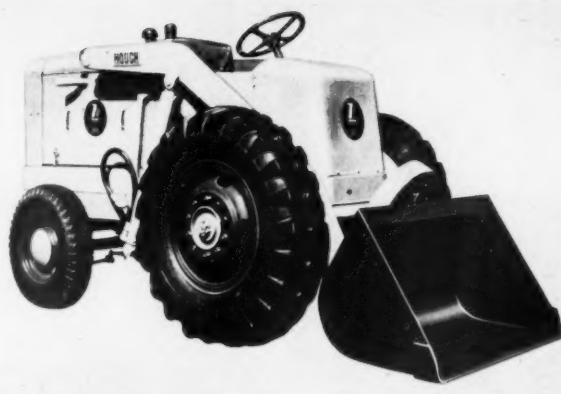
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Now Even Better



The Hough Payloader Models HA and HAH now have torque converters.

Tractor Shovels Get Torque-Converter Drive

■ New models of its HA and HAH front-end shovel-loaders now have torque-converter-drive as standard equipment, the Frank G. Hough Co., 762 Seventh St., Libertyville, Ill., announces.

The Model HA has a payload capacity of 16 cubic feet and a struck capacity of 12 cubic feet. The Model HAH has a payload capacity of 24 cubic feet and a struck capacity of 18 cubic feet—an increase over the old model of this unit. The HAH

model is equipped with power steering.

The torque converter used is of the three-element, self-cooled type that automatically multiplies torque output of the engine in direct proportion to the load requirements. During light-load conditions, it automatically reverts to efficient fluid-coupling action.

For further information write to the company, or use the Request Card at page 18. Circle No. 533.

Flashing Barricade Offered for Rental

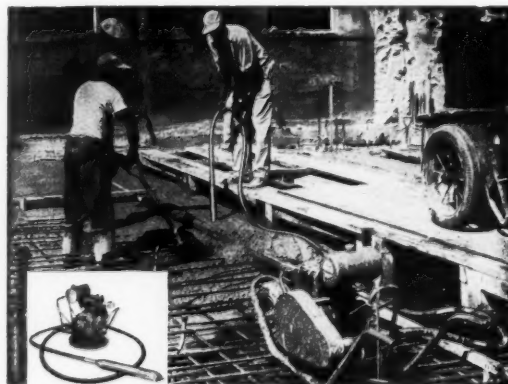
■ A steel barricade with a battery-operated warning flasher may now be obtained on a rental basis from Light Products, Inc., 407 Commercial Center St., Beverly Hills, Calif. The rental for the Neo-Flasher barricade is no more than the cost of operating one kerosene torch, according to the company. In addition to eliminating first cost, this arrangement also does away with expenditures for premium week-end labor and storage. The warning light will operate about 1,000 hours on its battery.

The Model A Neo-Flasher steel barricade comes equipped with a reflectorized steel panel, the Neo-Flasher Model 1-100-LSR warning

light, and a tamper-proof switch and locking device. The customer's name plate may be attached at extra charge.

The company also offers single and two-head directional warning lights, a yellow "caution" light, and a red "stop" light. A four-headed "hazard" light and an obstruction light are each equipped with a light cell which automatically turns off at dawn and on at dusk. Warning flags with standards are available in sets of twelve.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 663.



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CONTRACTORS AND ENGINEERS



Three of the Rolatape wheel-type measuring devices.

Calibrated Wheels for Linear Measurements

A new series of calibrated wheels for measuring linear distances is announced by Rolatape, Inc., 1741 Fourteenth St., Santa Monica, Calif. The Distometer devices are operated by one man.

The most popular of the units is the Model 200, which is 2 feet in circumference. It registers up to 100 feet, then repeats the cycle. It easily and accurately permits measuring from wall to wall, around corners, and around curves and contours. It can be used for horizontal, vertical, lateral, or diagonal measuring.

Total distance is recorded in feet and inches on an easy-to-read linearity counter and a recessed scale on the wheel circumference. A clearly audible click every two feet permits a running count, while a bell tone indicates the 100-foot total. A knob allows the operator to reset the wheel at any time. This model weighs only 2 3/4 pounds, has a 34-inch collapsible handle, and folds for convenient carrying.

The Model 400 provides a measuring wheel exactly 4 feet in circumference and registers distances up to approximately nineteen miles, thereafter repeating the cycle. It can be operated by one man as he drives slowly over the course to be measured. The unit weighs 5 pounds.

For further information write to

the company, or use the Request Card at page 18. Circle No. 520.

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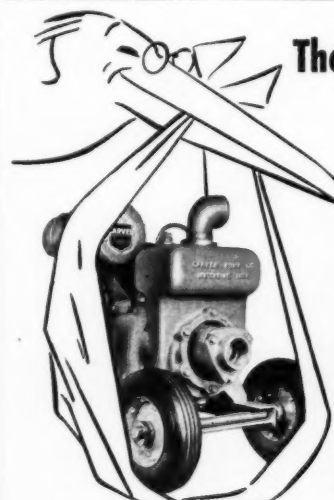
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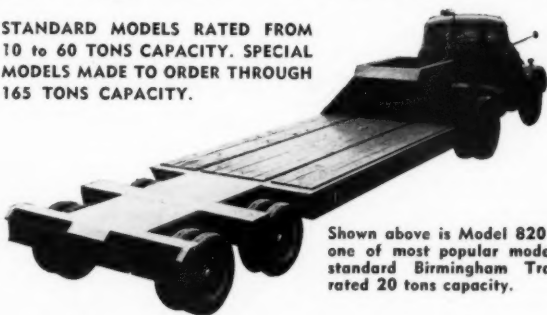
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Birmingham Heavy Duty Trailers

STANDARD MODELS RATED FROM 10 to 60 TONS CAPACITY. SPECIAL MODELS MADE TO ORDER THROUGH 165 TONS CAPACITY.



Shown above is Model 820 FLR, one of most popular models of standard Birmingham Trailers, rated 20 tons capacity.

Model 820 FLR shown above fills the need of 99 percent of all haulers. It has tandem axles, is light weight (9,000 lbs.) and gives you maximum payload. It has proved to be a most popular model.

The Birmingham Rocker Beams are fabricated in box sections and are mounted on 4 Brass Bushings, 4" diameter by 6" length. These are greatly oversized for the loads. The bushing assemblies are completely enclosed at one end. The position of the alemit fitting in the closed end feeds the grease out and prevents road dust and grit from damaging the bushing. Frames are electrically welded open-hearth steel shapes. Decks are oak, surfaced to 2 3/4" thickness. Axles by Standard Forge and Axle Company have Timken bearings. Bendix Westinghouse airbrakes. Full I.C.C. lighting and directional signals.

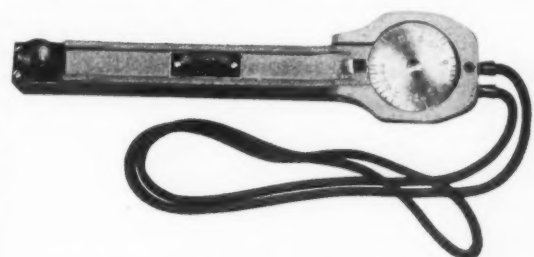
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BIRMINGHAM MANUFACTURING COMPANY, Inc.

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Meyer

FIELD RANGEFINDER



FOR INSTANTLY MEASURING DISTANCES
UP TO 100 FEET
ACCURACY—2%

For descriptive literature write

Meyer-Opticraft INC.

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MANUFACTURER MEMOS

Aeroil Products Names Halperin Vice President

Joseph Halperin, general manager of Aeroil Products Co., Inc., South Hackensack, N. J., has been elected vice president of the company by the board of directors. Mr. Halperin has been in charge of streamlining production procedures for the organization, manufacturer of tool heaters and other units for road and general contractors. Prior to joining Aeroil in 1951, Mr. Halperin was

with Curtiss-Wright Corp., Buffalo, N.Y.

Louis Neumiller Heads Board of Caterpillar

New chairman of the board of Caterpillar Tractor Co., Peoria, Ill., is Louis B. Neumiller, president of the company for the last 12 years. He was elected at a board meeting at the company's corporate office at San Leandro, Calif.

Harmon S. Eberhard was named



Louis B. Neumiller, new chairman of the board of Caterpillar Tractor Co., Peoria, Ill.

president to succeed Mr. Neumiller. Harry H. Fair, retiring chairman of

the board, continues as a director of the company. The executive committee was disbanded, but the chairman, B. C. Heacock, also will continue as a director. Other incumbent officers were re-elected.

Mr. Neumiller has been with Caterpillar since 1915, when he joined the organization as a stenographer-clerk. In 1941, after many years experience in various departments of the company, he was elected president. Under his direction the firm's physical layout and sales were expanded greatly during a postwar modernization program.

The new president joined Caterpillar just one year later than Mr. Neumiller. Mr. Eberhard began his career as a draftsman and moved up in the firm's engineering department. He served as chief engineer from 1933 to 1942, when he was named vice president in charge of engineering, manufacturing, and research. He was appointed executive vice president in 1950.



Harmon S. Eberhard, president of the Caterpillar Tractor Co.

Topples trees, rips rocks, fills gullies

TIMKEN® bearings keep it on the go

THIS International Harvester TD-14A tractor was built to handle hundreds of tough, dirty jobs with minimum time-out for maintenance and repair. One example of its rugged construction: the front track idlers are mounted on Timken® tapered roller bearings.

The track idler bearings have to take heavy radial shock loads when the track hits boulders, trees and other obstacles. And they must also be able to withstand heavy thrust loads, especially when the TD-14A

bounces or slips off boulders and large clumps of dirt as well as in turn skids.

The tapered design of Timken bearings lets them handle both radial and thrust loads with ease. And line contact between rollers and races gives them load-carrying capacity to spare. On top of that, Timken bearings are case-hardened to give them hard, wear-resistant surfaces over tough, shock-resistant cores.

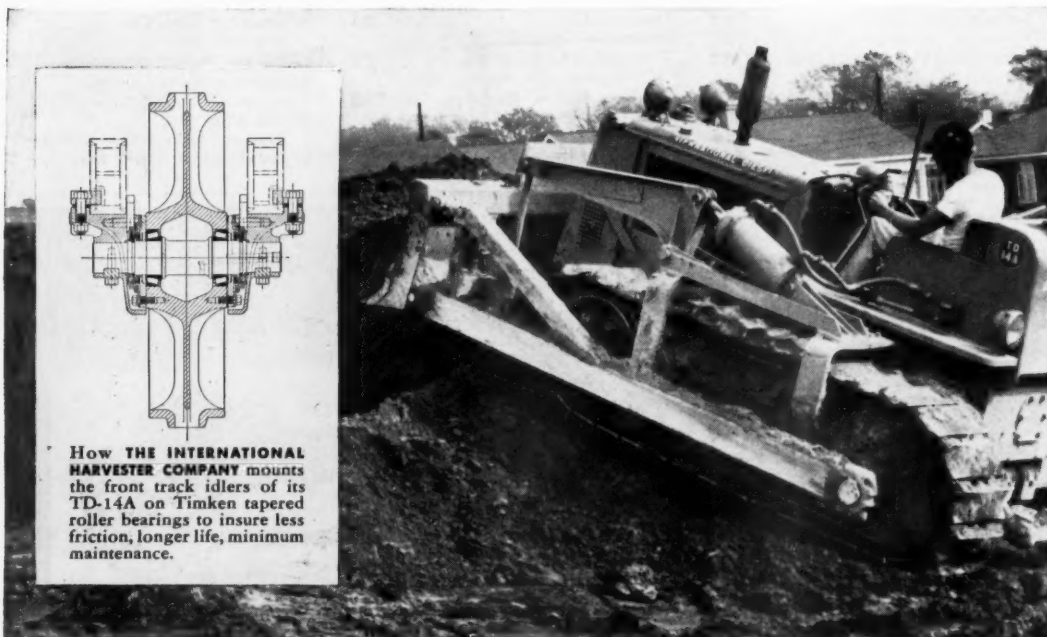
Timken tapered roller bearings

help solve the problem of deep muck, mud and water by holding housings and shafts concentric. This makes closures more effective. Mud and water stay out, lubricant stays in.

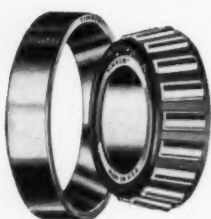
Make sure you specify Timken bearings in all the equipment you build or buy. Look for the trademark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.



How THE INTERNATIONAL HARVESTER COMPANY mounts the front track idlers of its TD-14A on Timken tapered roller bearings to insure less friction, longer life, minimum maintenance.



TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



WE MAKE OUR OWN STEEL

The special grade alloy steel which gives Timken bearings their strength and resistance to wear is made in our own steel mills.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

NOT JUST A BALL ○ NOT JUST A ROLLER □ THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST ——— LOADS OR ANY COMBINATION

Head of T. L. Smith Co. Dies on European Trip

Harold E. Smith, president of the T. L. Smith Co., pioneer Milwaukee, Wis., manufacturer of concrete mixers, died in Paris while on a European vacation trip with Mrs. Smith. He was 64 years old.

He was the son of the late Thomas L. Smith, founder in 1900 of the manufacturing concern. He became associated with the firm as a salesman in 1913 after being graduated from the University of Wisconsin. He was appointed sales manager in 1915 and elected president in 1916.

Mr. Smith was vice president and a director of the Sterling Wheelbarrow Co., Milwaukee. He helped found both the Mixer Manufacturers Bureau and the Truck Mixer Manufacturer Bureau, and for years was chairman of the former group.

Harold Smith is survived by a son, Robert Witte Smith, executive vice president of the T. L. Smith Co.



Carl R. Rolf, member of the board of directors of Pioneer Engineering Works, Inc.

Pioneer Names Rolf To Board of Directors

The vice president in charge of sales for Pioneer Engineering Works, Inc., Minneapolis, Minn., Carl R. Rolf, has been elected to the company's board of directors. Pioneer, a subsidiary of Poor & Co., Chicago, manufactures heavy equipment for the gravel, crushed stone, asphalt, and paving industries.

Mr. Rolf, joining Pioneer in 1929, has since served the company as district sales representative, assistant sales manager, assistant secretary and sales manager, and vice president and sales manager.

Changes at Lincoln Electric

Robert Wilson, head of application engineering and director of training for Lincoln Electric Co., Cleveland Ohio, has been elected to the company's board of directors.

Starting with Lincoln as a field engineer in 1935, he moved into the development laboratory and then into the application engineering department. He assumed responsibility for the department in 1950, and became director of training in 1952.

The company has also made a series of personnel changes. Four application engineers have been assigned to field districts: Robert Clipsham to Kansas City, Gordon Collier to Philadelphia, John Gonzales to Columbus, and Donald Hastings to Emeryville.

Robert E. Sage has been made assistant to J. S. Roscoe, executive vice president, and will act as an administrative assistant for sales.

The newly created position of dealer sales manager for Lincoln has been filled by Albert Patnik.

Changes at Atlas Powder

The Atlas Powder Co., Wilmington, Del., has made two personnel changes in its explosives department. The newly appointed manager of the contractors section is William T. Mahood, formerly a sales manager for the organization. He joined Atlas in 1936 as a sales representative.

George Gabuzda is manager of the development and standards section in the department's manufacturing division. In addition to his new duties, Mr. Gabuzda will be responsible for the development of new products. He has been with the company since 1942, and since 1953 has been on special assignments in the manufacturing division in the general office of the organization.

Personnel Advancements Made at Universal Atlas

Fred L. Wagner, formerly Pittsburgh sales manager for Universal Atlas Cement Co., New York, N. Y., has been made vice president of sales for the eastern and southern region. He succeeds Albert O. Stark, who has retired. Filling the position formerly held by Mr. Wagner is Louis V. Walsh.

Prior to becoming a sales manager in 1947, Mr. Wagner served in the

company's sales department for more than 20 years. Mr. Walsh has been with the company since 1925.

Le Roi Appointment

C. I. Bohmer has been named assistant to the general manager of the Le Roi-Tranco truck-mounted mixer division, Dunkirk, Ohio. He will act as an advisor and field research and technical engineer for the Le Roi Co. division.

Mr. Bohmer, formerly chief engineer of Jaeger Machine Co., has

served as chairman of the technical committee of the National Ready Mix Manufacturers Association for the past three years.

New P&H Division Manager

Heading the new division established by Harnischfeger Corp., Milwaukee, Wis., to handle sales of P&H electrical equipment is Oliver Fuller. Mr. Fuller was formerly of P&H Welder & Excavator Mfg., Escanaba, Mich.



CAT* D397 ELECTRIC SETS POWER FIVE-YARD SHOVELS ON HARD-ROCK SECTION OF N. Y. THRUWAY



Between Whitesport and Kingston, N.Y., construction of the New York State Thruway requires blasting and excavating through solid rock. George M. Brewster & Son, Inc., subcontractor on this 9.27-mile section, uses two Bucyrus-Erie five-yard electric shovels to load out rock after blasting. And power for each of them is supplied by a Caterpillar Diesel D397 Electric Set that delivers 315 KW. One of the generator units is mounted on skids, the other on a trailer, for easy relocation.

No power line was readily available at this location, thus the cost of running transmission lines would be extremely high. Since the Brewster firm wanted to use its big electric shovels to handle larger rock and save shooting costs, it tried the first shovel and electric set team as an experiment.

The savings have proved well worth while. Fast production is one result, and low-cost electric power is another. The Caterpillar units operate steadily on No. 2 furnace oil without fouling, and they require a minimum of atten-

tion. Even in competition with utility power, the readily movable electric sets save the repeated cost of hooking up to a power line each time the shovel changes location.

Your Caterpillar Dealer can show you many other advantages of these dependable, trouble-free units. He has 12 sizes of engines and electric sets up to 500 HP and 315 KW, and backs their long, money-saving work life with reliable service and genuine parts. Give him a call today.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—(C)

**SPECIFY CAT POWER
FOR HIGH-PROFIT
PERFORMANCE**



Why the new "81" Bituminous Plant will let you underbid your competitors

● Portability and Performance. There's the answer.

First, let's consider portability. The "81" consists of two main units, each complete on its own pneumatic-tired chassis, ready to pull in or pull out at a minute's notice. No holes to dig, no special alignment necessary. Just pull in, hook up, lay pipes, and go to work.

Those plant-hours and man-hours you'll save on each move count up *fast* in dollars and cents.

Continuous, non-stop flow

Now let's examine performance. The steady, uniform, uninterrupted flow of material from the "81" keeps your trucks busy. You vary the mix by remote control of the bitumen pump or by adjusting the gates on the aggregate feeder without stopping the plant. Clam gates on the discharge hopper load your trucks without segregation, cutting off the flow when trucks pull in and out—again without slowing the plant. This famous *Continuflo* operation gives you more yards a day...*low cost yards*, too.

All mixing is fully automatic, for the asphalt metering pump is interlocked with the aggregate feeder to *guarantee* exact proportioning. There can be no variation. The human element is out, and correct proportioning is certain.

Other features

Other important PIONEER features include an auxiliary air inlet in the drier to provide extra air to carry off excess moisture . . . 90% efficient multicone dust collector . . . pre-mix chamber where hot, dry aggregates are mixed *before* bitumen is added . . . heavily insulated bitumen tank which cuts heat loss . . . patented anti-caking pugmill . . . and central location of all gauges, indicators, and control lever to permit control of entire mixer unit from a single platform. The entire plant is driven by electric motors with central-station push-button control.

Stout construction—quality fittings

Certainly, the extra heavy welded construction and use of the best pumps, bearings, and fittings obtainable have added a little to the manufacturing

	MODEL 51	MODEL 81	MODEL 101
First Unit	Mixer and gradation screen with 3 compartment bin	Mixer and gradation screen with 3 compartment bin	Mixer and gradation screen with 3 compartment bin
Second Unit	Drier, dust collector and burner	Drier, dust collector and burner	Drier
Third Unit	—	—	Dust collector
Auxiliary Units	Feeder elevator (with necessary feeder), hot elevator and fines feeder (if desired)	Feeder conveyor (with necessary feeder), hot elevator and fines feeder (if desired)	Feeder conveyor (with necessary feeder), hot elevator, burner and fines feeder (if desired)
Rated Cap.	40-60 yds./hr.	60-80 yds./hr.	80-110 yds./hr.
Total Wt. (Approx.)	68,000 lbs.	86,500 lbs.	125,000 lbs.
Approx. HP Req. (Elec.)	100	143	200

costs, but the next time you seek a blacktop job, just consider the "81"...and how it will let you turn in a lower bid.

Want details? Write Pioneer Engineering Works, Inc., Minneapolis, (subsidiary of Poor & Company, Chicago) or nearest PIONEER distributor.

BUY BOTH!
HIGHER OUTPUT
LOWER UPKEEP

Pioneer

Continuflo EQUIPMENT

Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.

Please send information on equipment checked.

- ☐ GRAVEL PLANTS ☐ WASHING PLANTS ☐ MECHANICAL FEEDERS
☐ ROCK PLANTS ☐ BITUMINOUS PLANTS ☐ VIBRATING SCREENS
☐ JAW CRUSHERS ☐ APRON FEEDERS ☐ BUZZER SCREENS (LIGHT DUTY)
☐ ROLL CRUSHERS ☐ GDO FEEDERS ☐ CONTINUFLU CONVEYORS

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Company

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City Zone State



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MODEL 101
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Drier
collector
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